

INVESTIGATING SCHOOL MATHEMATICS

WORKBOOK



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Investigating School Mathematics

Workbook

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ADDISON-WESLEY (CANADA) LTD.

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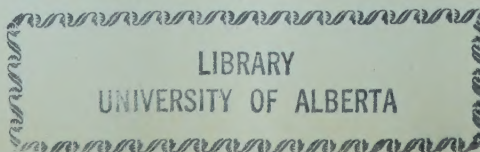
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PRINTED IN CANADA.

ISBN 0-201-01106-9

CDEFG 80797877



1. These letters can be printed using exactly 3 segments.

A K F H

These letters can be printed using more or less than 3 segments.

E O T W

Make 3 more printed letters using exactly 3 segments.

2. All of these words are "special."

one era
ace use

None of these words are "special."

the eat
bear of

Ring the "special" words in this set.

ask ice
ore tea

3. All of these numbers are multiples of 9.

27 54 90
63 702 9

None of these numbers are multiples of 9.

7 16 40
32 119 56

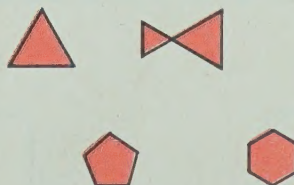
Ring the multiples of 9 in this set.

25 66 81
39 108 75

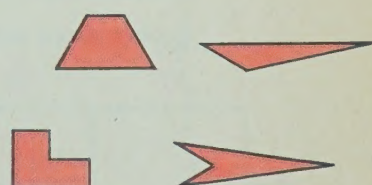
4. All of these regions are in a special set.



None of these regions are in the special set.



Ring the regions that are in the special set.



5. All of these fractions are "special."



















$\frac{1}{5}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{5}{8}$
 $\frac{3}{4}$ $\frac{9}{16}$ $\frac{11}{12}$

None of these fractions are "special."

$\frac{5}{10}$ $\frac{7}{21}$ $\frac{6}{8}$ $\frac{12}{16}$
 $\frac{8}{12}$ $\frac{14}{32}$ $\frac{3}{9}$

Ring the "special" fractions in this set.

$\frac{4}{6}$ $\frac{3}{8}$ $\frac{6}{9}$ $\frac{13}{20}$
 $\frac{9}{54}$ $\frac{4}{5}$ $\frac{17}{24}$

	TRIANGLES		CIRCLES		SQUARES	
	Large	Small	Large	Small	Large	Small
RED						
GRAY						
WHITE						

1. Write the name of the attribute piece that is described in each part.

A It is red.
It is round.
It is not small.

B It is gray.
It is a square.
It is not large.

C It has 3 sides.
It is not large.
It is red.

D It is not red.
It is not white.
It is not large.
It is a square.




E It is gray.
It is not a square.
It is large.
It is not a circle.

F It is small.
It is not red.
It is not gray.
It is round.

2. Fill in the table with the correct attribute pieces.

Down: Same size and shape




Across: Same color

3. Fill in the table with the correct attribute pieces.

Down: Same color and size

Across: Same shape

1. Find the pattern in each sequence. Then give the next three numbers in the sequence.

A 1, 4, 7, 10, _____, _____, _____

F 1, 3, 6, 9, _____, _____, _____

B 2, 4, 8, 16, _____, _____, _____

G 1, 11, 21, 31, _____, _____, _____

C 0, 6, 12, 18, _____, _____, _____

H 0, 7, 14, 21, _____, _____, _____

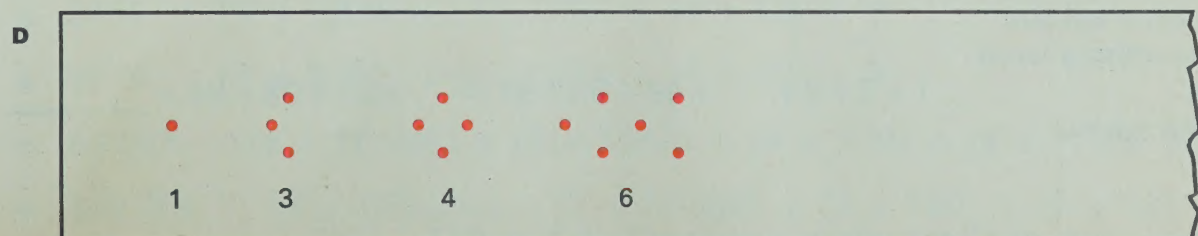
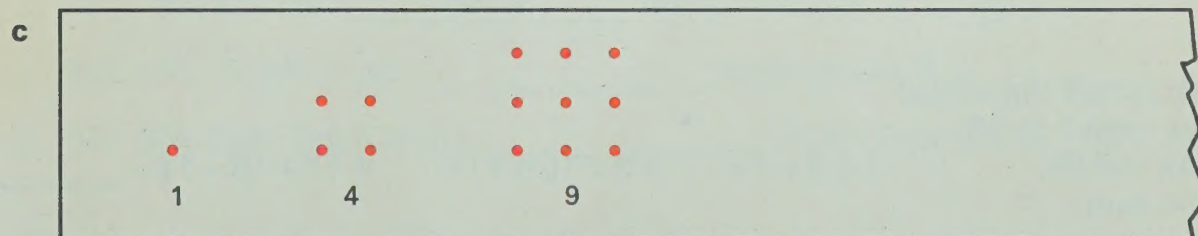
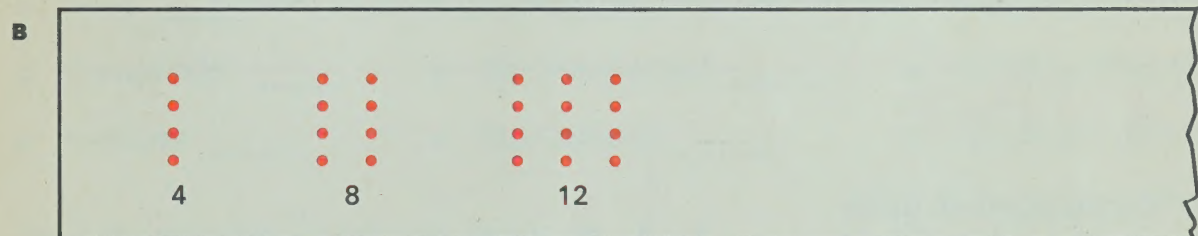
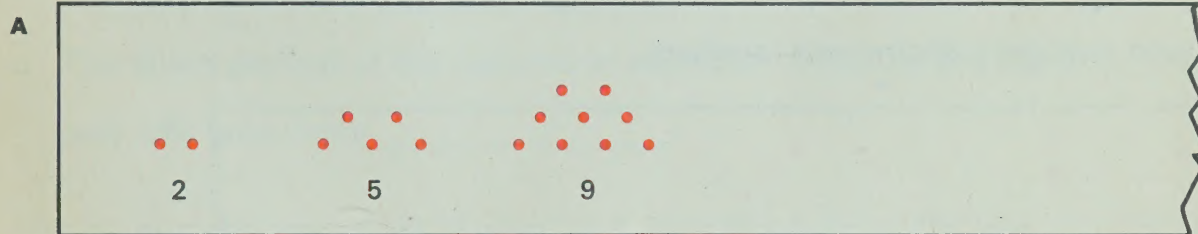
D 1, 12, 23, 34, _____, _____, _____

I 1, 2, 4, 5, 7, _____, _____, _____

E 1, 2, 4, 5, 7, 8, 10, _____, _____, _____

J 1, 4, 3, 6, 5, _____, _____, _____

2. Study the dot patterns. Show the next two dot patterns and give the numbers in each sequence.



1. Write the name of the attribute piece that is described in each part.

A It is gray.
It is not large.
It is neither a square nor a circle.

B It is large.
It is square.
It is not red.
It is not gray.

C It is round.
It is not large.
It is not red.
It is not white.

2. All of these numbers have a special property.

24 18 15
3 51
12 75 39

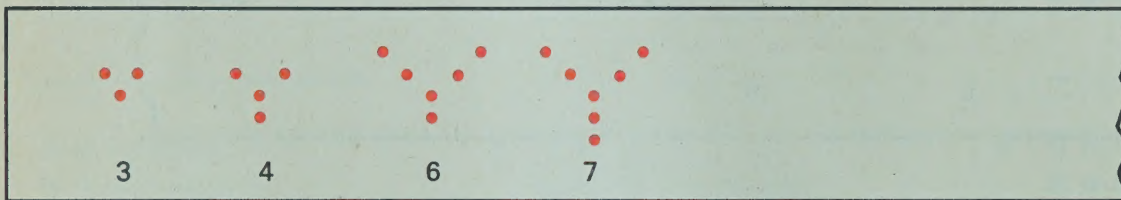
None of these numbers have the special property.

8 20 16
25 11 100
49 56

Which of these numbers have the special property?

14 37 21 13
76 9 10

3. Give the next two dot patterns and numbers.



CHANGE OF PACE

1. Think of the numbers in pairs as shown by the colored lines. Write the sum.

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = \underline{\hspace{2cm}}$$


2. Think about **all** the whole numbers from 1 to 19 paired as shown. Write the sum.

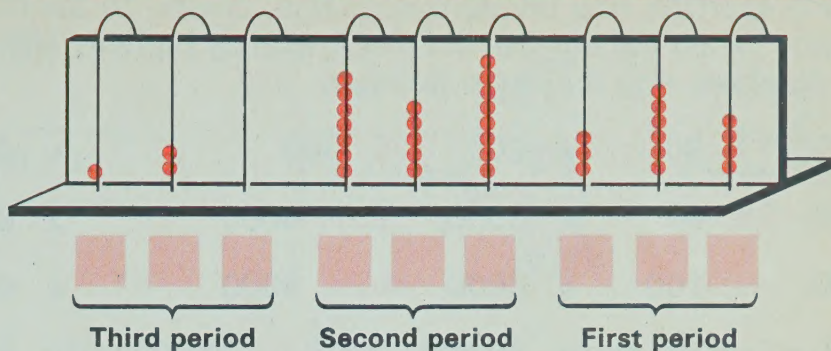
$$1 + 2 + 3 + \cdots + 9 + 10 + 11 + \cdots + 17 + 18 + 19 = \underline{\hspace{2cm}}$$






3. Think about **all** the whole numbers from 1 to 99. Write the sum.

$$1 + 2 + 3 + \cdots + 49 + 50 + 51 + \cdots + 97 + 98 + 99 = \underline{\hspace{2cm}}$$

4. What is the sum of **all** the whole numbers from 1 to 49?

1. Write the correct digit in each  to tell the number of beads in each place on the abacus.



2. A The **first period** of the numeral in exercise 1 contains the digits 3, 6, 4 and tells how many ones.
- B The **second period** of the numeral in exercise 1 contains the digits _____ and tells how many _____.
- C The **third period** of the numeral in exercise 1 contains the digits _____ and tells how many _____.
3. For the numeral you wrote in exercise 1, give the digit for the following places.
- | | | |
|--------------------|------------------------|----------------------------|
| A ones' _____ | D tens' _____ | G hundreds' _____ |
| B thousands' _____ | E ten thousands' _____ | H hundred thousands' _____ |
| C millions' _____ | F ten millions' _____ | I hundred millions' _____ |
4. Give the missing words and numbers.
- A 764: The 6 in the tens' place means $6 \times$ 10.
- B 928 456: The 8 in the _____ place means $8 \times$ _____.
- C 347 561 298: The 5 in the _____ place means $5 \times$ _____.
5. Give the correct sign ($<$, $>$, or $=$) for each .
- A 3489  $(3 \times 1000) + (4 \times 100) + (8 \times 10) + 9$
- B 5278  $(5 \times 1000) + (3 \times 100) + (7 \times 10) + 8$
- C 69 543  $(6 \times 10\,000) + (9 \times 1000) + (4 \times 100) + (4 \times 10) + 3$
- D 302 765  $(3 \times 100\,000) + (2 \times 10\,000) + (7 \times 100) + (6 \times 10) + 5$

1. In each exercise, ring the number that is "closer" to the number shown in color. When the number in color is exactly halfway between the two numbers, ring the larger number.

- | | | |
|---------------|--------------------------|-----------------------------|
| A 70, 74, 80 | E 200, 235, 300 | I 40 000, 48 655, 50 000 |
| B 50, 56, 60 | F 3000, 3657, 4000 | J 8000, 8500, 9000 |
| C 90, 93, 100 | G 8000, 8523, 9000 | K 400 000, 456 000, 500 000 |
| D 60, 65, 70 | H 60 000, 65 324, 70 000 | L 500 000, 542 375, 600 000 |

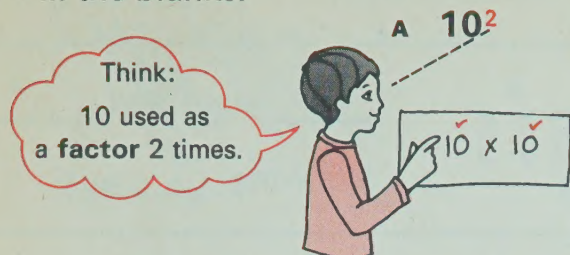
2. Ring the number that best completes the sentence.

- A 59 364 rounded to the nearest ten is 59 360
59 370
- B 59 364 rounded to the nearest hundred is 59 800
59 400
- C 59 364 rounded to the nearest thousand is 59 000
60 000
- D 676 499 rounded to the nearest thousand is 676 000
677 000
- E 845 264 rounded to the nearest ten thousand is 840 000
850 000
- F 6 362 800 rounded to the nearest hundred thousand is 6 300 000
6 400 000
- G 8 500 001 rounded to the nearest million is 8 000 000
9 000 000
- H 54 947 000 rounded to the nearest ten million is 50 000 000
60 000 000

3. Give the missing numbers.

- | | |
|--|---|
| A 386 rounded to the nearest
10 is _____. | D 967 582 rounded to the nearest
1000 is _____. |
| B 87 643 rounded to the nearest
100 is _____. | E 8 647 386 rounded to the nearest
10 000 is _____. |
| C 9550 rounded to the nearest
100 is _____. | F 868 576 321 rounded to the nearest
million is _____. |

1. Fill the blanks.



$$10^2 = \underline{\quad} \times \underline{\quad} = \underline{\quad}$$



$$10^3 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$$

2. Fill the blanks.

A For 10^4 , we think of 10 used as a factor times.

$$10^4 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

B For 10^5 , we think of 10 used as a factor times.

$$10^5 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

C For 10^6 , we think of 10 used as a factor times.

$$10^6 = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3. Write as many zeros after the 1 as the exponent indicates.
Then check to see if the equations are correct.

A $10^1 = \underline{10}$

C $10^3 = \underline{1}$

E $10^5 = \underline{1}$

B $10^2 = \underline{100}$

D $10^4 = \underline{1}$

F $10^6 = \underline{1}$

4. Find the products.

A $4 \times 10^1 = \underline{40}$

D $5 \times 10^4 = \underline{\hspace{2cm}}$

G $32 \times 10^3 = \underline{\hspace{2cm}}$

B $7 \times 10^2 = \underline{\hspace{2cm}}$

E $9 \times 10^5 = \underline{\hspace{2cm}}$

H $16 \times 10^2 = \underline{\hspace{2cm}}$

C $26 \times 10^1 = \underline{\hspace{2cm}}$

F $41 \times 10^2 = \underline{\hspace{2cm}}$

I $50 \times 10^4 = \underline{\hspace{2cm}}$

5. Find a number less than 10 for each blank. Give the missing exponents in each .

A $300 = \underline{3} \times 10^{\underline{2}}$

D $6000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

G $700\,000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

B $4000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

E $20\,000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

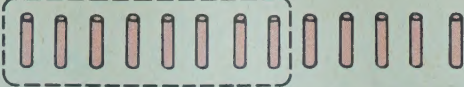








H $9\,000\,000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

C $800 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

F $500\,000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

I $1\,000\,000 = \underline{\hspace{1cm}} \times 10^{\underline{\hspace{1cm}}}$

Draw rings to group the sticks as indicated. Then fill the blanks.

1. In **BASE EIGHT**,
group by **eights**.  _____ eight and _____
We write _____(8).
2. In **BASE SIX**,
group by **sixes**.  _____ sixes and _____
We write _____(6).
3. In **BASE FOUR**,
group by **fours**.  _____ fours and _____
We write _____(4).
4. In **BASE FIVE**,
group by **fives**.  _____ fives and _____
We write _____(5).
5. In **BASE SEVEN**,
group by **sevens**.  _____ seven and _____
We write _____(7).
6. In **BASE SIX**,
group by **sixes**.  _____ sixes and _____
We write _____(6).
7. In **BASE FOUR**,
group by **fours**.  _____ fours and _____
We write _____(4).
8. In **BASE EIGHT**,
group by **eights**.  _____ eight and _____
We write _____(8).
9. In **BASE SIX**,
group by **sixes**.  _____ sixes and _____
We write _____(6).

1. Group the pencils by sixes. Then give the sums.



$$3_{(6)} + 4_{(6)} = \underline{\hspace{1cm}}_{(6)}$$



$$5_{(6)} + 5_{(6)} = \underline{\hspace{1cm}}_{(6)}$$



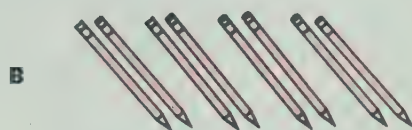
$$2_{(6)} + 4_{(6)} = \underline{\hspace{1cm}}_{(6)}$$

2. Group the pencils by sixes. Then give the products.



3 groups of 3

$$3_{(6)} + 3_{(6)} = \underline{\hspace{1cm}}_{(6)}$$



4 groups of 2

$$4_{(6)} + 2_{(6)} = \underline{\hspace{1cm}}_{(6)}$$



2 groups of 5

$$2_{(6)} + 5_{(6)} = \underline{\hspace{1cm}}_{(6)}$$

3. Complete the base-six addition and multiplication tables.

A

+	0	1	2	3	4	5
0						
1						
2						
3					11	
4						
5						14

B

×	0	1	2	3	4	5
0						
1						
2						
3				13		
4			12			
5						

4. Complete the counting in base six to $30_{(6)}$.

$1_{(6)}$, $2_{(6)}$, $3_{(6)}$, , , , $11_{(6)}$, , ,
 , , $20_{(6)}$, , , , , $30_{(6)}$

5. Find the sums and differences. Use base-six numerals.

A

$$\begin{array}{r} 5_{(6)} \\ + 2_{(6)} \\ \hline \end{array}$$

B

$$\begin{array}{r} 10_{(6)} \\ - 3_{(6)} \\ \hline \end{array}$$

C

$$\begin{array}{r} 15_{(6)} \\ + 5_{(6)} \\ \hline \end{array}$$

D

$$\begin{array}{r} 21_{(6)} \\ - 4_{(6)} \\ \hline \end{array}$$

E


$$\begin{array}{r} 34_{(6)} \\ + 3_{(6)} \\ \hline \end{array}$$







F

$$\begin{array}{r} 52_{(6)} \\ - 3_{(6)} \\ \hline \end{array}$$

1. For the numeral 496 307 528 give the digit for the following places.

- A ones' _____ D tens' _____ G hundreds' _____
 B thousands' _____ E ten thousands' _____ H hundred thousands' _____
 C millions' _____ F ten millions' _____ I hundred millions' _____

2. Give the correct sign ($<$, $=$, or $>$) in each .

- A 685  $600 + 50 + 8$ C 9461  9416 E 12 700  12 080
 B 3549  $3000 + 40 + 500 + 9$ D 5691  5966 F 79 308  79 083

3. Ring the number that best completes the sentence.

- A 364 582 rounded to the nearest **ten** is $\begin{matrix} 364\ 580 \\ 364\ 590 \end{matrix}$
 B 364 582 rounded to the nearest **thousand** is $\begin{matrix} 364\ 000 \\ 365\ 000 \end{matrix}$

4. Find the products.

- A $5 \times 10^2 =$ _____ B $4 \times 10^3 =$ _____ C $8 \times 10^5 =$ _____

5. Find the sums and products.

- A $3_{(6)} + 2_{(6)} =$ _____ B $4_{(6)} + 5_{(6)} =$ _____ C $3_{(6)} \times 5_{(6)} =$ _____

CHANGE OF PACE

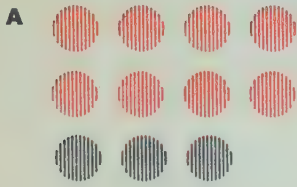
Some Chinese-Japanese number symbols are given in the table below.

Our Base Ten Symbols	1	2	3	4	5	6	7	8	9	10	100	1000
Chinese-Japanese Symbols	一	二	三	四	五	六	七	八	九	十	百	千

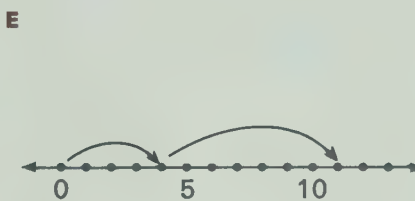
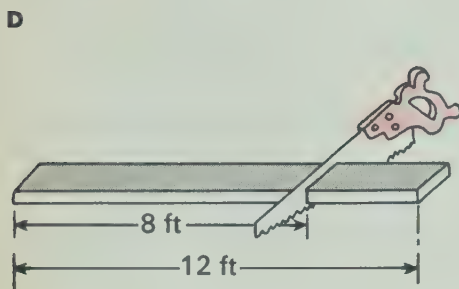
In the Chinese-Japanese system the symbols are written vertically. The numerals in the first three boxes below show how to write 40, 46, and 359. Study them. Then use Chinese-Japanese symbols to write the numbers indicated in the last four boxes.

40	46	359	20	87	216	3459
四 十	四 十 六	三 百 五 十 九				

1. Write an equation for each picture.



$$8 + 3 = 11$$



40 apples. Same amount in each bag.

2. Write **A**, **S**, **M**, or **D** to show which operation (Addition, Subtraction, Multiplication, or Division) you would use to solve each problem.

- A $\square\square\square$ blocks to school.
Walk this distance
 $\square\square\square$ times a day.

Walk how many blocks? _____

- B Peg had $\square\square\square$ records.
She bought $\square\square\square$ more.

How many records now? _____

- C There are $\square\square\square$ boys
and $\square\square\square$ candy bars.
How many candy bars

for each boy? _____

- D Ken had $\square\square\square$ cents.
He spent $\square\square\square$ cents.

How many cents left? _____

- E $\square\square\square$ majorettes.
 $\square\square\square$ band members.

How many in all? _____

- F $\square\square\square$ theatre rows.
 $\square\square\square$ seats in each row.
How many seats are

in the theatre? _____

1. You can subtract by finding the missing addend. Write the correct answer in the box.

Sum		Addend		Addend
16	-	7	=	<input type="text"/>



$? + 7 = 16$

2. Find the differences by thinking about missing addends.

S	A	A
A	18 - 9 =	<input type="text"/>

S	A	A
D	17 - 8 =	<input type="text"/>

S	A	A
G	13 - 8 =	<input type="text"/>

S	A	A
B	16 - 8 =	<input type="text"/>

S	A	A
E	16 - 9 =	<input type="text"/>

S	A	A
H	14 - 6 =	<input type="text"/>

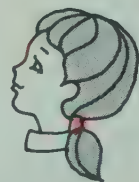
S	A	A
C	15 - 7 =	<input type="text"/>

S	A	A
F	13 - 5 =	<input type="text"/>

S	A	A
I	10 - 0 =	<input type="text"/>

3. You can divide by finding the missing factor. Write the correct answer in the box.

Product		Factor		Factor
56	÷	7	=	<input type="text"/>



$? \times 7 = 56$

4. Find the quotients by thinking about missing factors.

P	F	F
A	24 ÷ 8 =	<input type="text"/>

P	F	F
D	27 ÷ 3 =	<input type="text"/>

P	F	F
G	49 ÷ 7 =	<input type="text"/>

P	F	F
B	36 ÷ 6 =	<input type="text"/>

P	F	F
E	35 ÷ 5 =	<input type="text"/>

P	F	F
H	32 ÷ 4 =	<input type="text"/>

P	F	F
C	54 ÷ 9 =	<input type="text"/>

P	F	F
F	0 ÷ 4 =	<input type="text"/>

P	F	F
I	72 ÷ 9 =	<input type="text"/>

5. Solve the equations.

A $3 + 7 =$ _____

D $15 +$ _____ $= 22$

G $19 -$ _____ $= 10$

B $6 \times 5 =$ _____

E _____ $= 13 - 9$

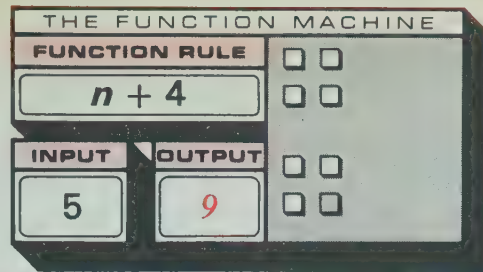
H $63 \div 9 =$ _____

C $3 \times$ _____ $= 21$

F $64 \div$ _____ $= 8$

I $4 \times$ _____ $= 32$

1. Give the correct output number in the space on the function machine.



Use 5 for n in the function rule.



2. Fill the blanks.

- A Using the words **output** and **input**, we can describe the function rule

above by writing "_____ number + 4 = _____ number."

- B Using n for "input number" and $f(n)$ for "output number," we describe the function rule above by writing "_____ + 4 = _____."

3. Use the rule on the function machine above to find the output number $f(n)$ for each input number n that is given.

- A $n = 6$; $f(n) =$ _____ B $n = 0$; $f(n) =$ _____ C $n = 9$; $f(n) =$ _____

4. Think about different rules on the function machine and complete the tables.

A

function rule	
$7 + n$	
INPUT	OUTPUT
n	$f(n)$
3	10
5	
6	
8	

B

function rule	
$4 \times n$	
INPUT	OUTPUT
n	$f(n)$
2	
4	
6	
7	

C

function rule	
$n + 10$	
INPUT	OUTPUT
n	$f(n)$
5	
7	
	20
	19

D

function rule	
$n \times 7$	
INPUT	OUTPUT
n	$f(n)$
0	
3	
5	
7	

E

function rule	
$n \times 9$	
INPUT	OUTPUT
n	$f(n)$
3	
0	
1	
	18

F

function rule	
$n \times 10$	
INPUT	OUTPUT
n	$f(n)$
3	
5	
	90
	100

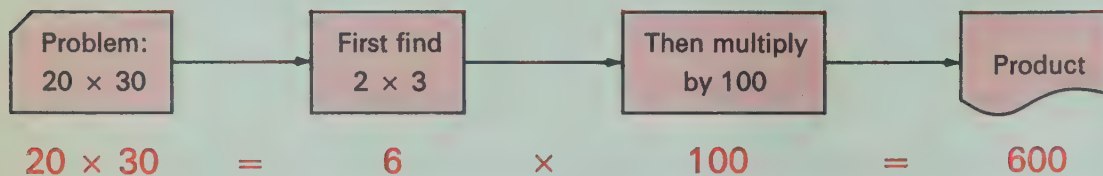
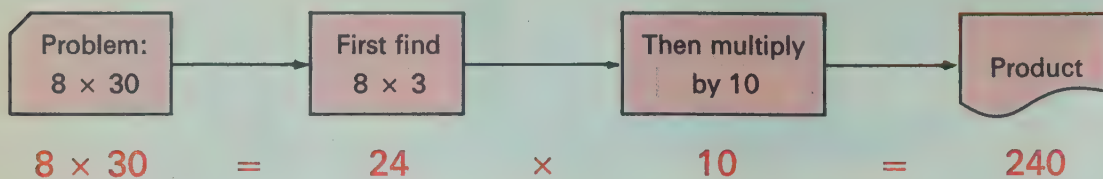
G

function rule	
$(n + 3) \times 2$	
INPUT	OUTPUT
n	$f(n)$
4	
6	
3	
0	

H

function rule	
$5 \times (n + 6)$	
INPUT	OUTPUT
n	$f(n)$
2	
4	
0	
14	

The flowcharts can help you find special products.



1. Solve the equations.

- | | |
|---|--|
| A $3 \times 40 = 3 \times 4 \times 10 = \underline{\hspace{2cm}}$ | E $30 \times 40 = 3 \times 10 \times 4 \times 10 = \underline{\hspace{2cm}}$ |
| B $5 \times 60 = 5 \times 6 \times 10 = \underline{\hspace{2cm}}$ | F $40 \times 20 = 4 \times 10 \times 2 \times 10 = \underline{\hspace{2cm}}$ |
| C $4 \times 80 = 4 \times 8 \times 10 = \underline{\hspace{2cm}}$ | G $70 \times 40 = 7 \times 10 \times 4 \times 10 = \underline{\hspace{2cm}}$ |
| D $5 \times 90 = 5 \times 9 \times 10 = \underline{\hspace{2cm}}$ | H $80 \times 10 = 8 \times 10 \times 1 \times 10 = \underline{\hspace{2cm}}$ |

2. Solve the first equation. Then use the result to help you solve the second equation.

- | | | |
|--|---|---|
| A Since $5 \times 70 = \underline{\hspace{2cm}}$,
then $350 \div 5 = \underline{\hspace{2cm}}$. | C Since $90 \times 7 = \underline{\hspace{2cm}}$,
then $630 \div 7 = \underline{\hspace{2cm}}$. | E Since $50 \times 80 = \underline{\hspace{2cm}}$,
then $4000 \div 80 = \underline{\hspace{2cm}}$. |
| B Since $6 \times 80 = \underline{\hspace{2cm}}$,
then $480 \div 6 = \underline{\hspace{2cm}}$. | D Since $40 \times 60 = \underline{\hspace{2cm}}$,
then $2400 \div 60 = \underline{\hspace{2cm}}$. | F Since $30 \times 50 = \underline{\hspace{2cm}}$,
then $1500 \div 50 = \underline{\hspace{2cm}}$. |

3. Find the products and quotients.

- | | | |
|---|---|---|
| A $450 \div 9 = \underline{\hspace{2cm}}$ | D $8 \times 90 = \underline{\hspace{2cm}}$ | G $10^1 \times 10^2 = \underline{\hspace{2cm}}$ |
| B $7 \times 80 = \underline{\hspace{2cm}}$ | E $40 \times 20 = \underline{\hspace{2cm}}$ | H $(3 \times 10^1) \times (5 \times 10^3) = \underline{\hspace{2cm}}$ |
| C $1600 \div 40 = \underline{\hspace{2cm}}$ | F $8100 \div 90 = \underline{\hspace{2cm}}$ | I $420 \div 60 = \underline{\hspace{2cm}}$ |

If 10 is multiplied by 4
and 3 is subtracted
from the product, what
is the resulting number?



Mark

This problem is
really hard !

1. A **flow chart** can help Mark how to solve the problem.
Write the output number in the output box.



2. Writing an **equation** for the problem is another way to
organize the information given in the problem.

Solve the equation for n . $(10 \times 4) - 3 = n$ $n = \underline{\hspace{2cm}}$

3. Give the missing number in each output box. Then write an equation
to describe the problem given in each flow chart.

					EQUATION
A	Input 33	Divide by 3	Subtract 1	Output _____	_____
B	Input 28	Subtract 8	Divide by 4	Output _____	_____
C	Input 10	Add 6	Multiply by 2	Output _____	_____

4. Write an equation for each part. Then solve the equation.

- A Find the number that is 6 less
than the product of 7 and 8.

Equation: _____

Solution: _____

- B Find the product of 9 times the
difference of 13 and 8.

Equation: _____

Solution: _____

1. Complete the function table.

function rule

$f(n) = (6 \times n) + 7$

n	$f(n)$
2	19
0	
4	
8	
7	

2. Function rule: $f(n) = (3 \times n) - 1$

If $n = 10$, then $f(n) = \underline{\hspace{2cm}}$.

3. Solve the equations. Think about missing addends.

S A A S A A

A $16 - 9 = \boxed{\hspace{1cm}}$ B $52 - 49 = \boxed{\hspace{1cm}}$

4. Solve the equations. Think about missing factors.

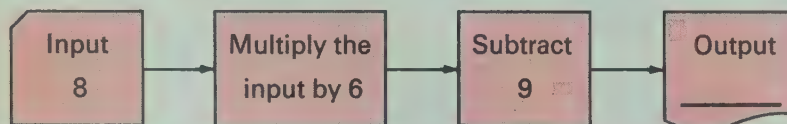
P F F P F F P F F P F F

A $56 \div 8 = \boxed{\hspace{1cm}}$ B $90 \div 10 = \boxed{\hspace{1cm}}$ C $8 \div 8 = \boxed{\hspace{1cm}}$ D $0 \div 6 = \boxed{\hspace{1cm}}$

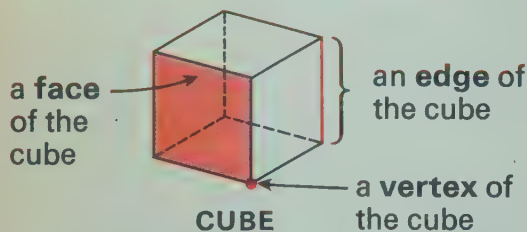
5. Find the products and quotients.

A $8 \times 70 = \underline{\hspace{2cm}}$ B $560 \div 8 = \underline{\hspace{2cm}}$ C $60 \times 70 = \underline{\hspace{2cm}}$ D $52 \times 10^2 = \underline{\hspace{2cm}}$

6. Give the missing number in the output box. Then write an equation to describe the problem in the flowchart.



CHANGE OF PACE



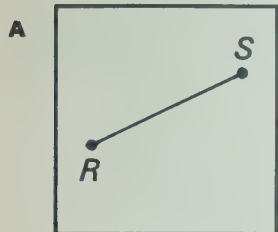
1. Complete this table.

Figure	Number of Vertices V	Number of Faces F	V + F	Number of Edges E
Cube				
Triangular pyramid				
Rectangular pyramid				
Octahedron				

2. It seems to be true that for any figure such as these,

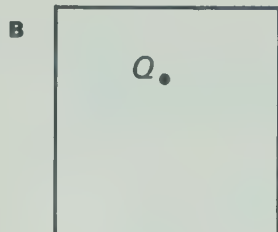
$V + F = E + \boxed{\hspace{1cm}}$

1. Give the name of each geometric figure and the symbol used to represent the figure.



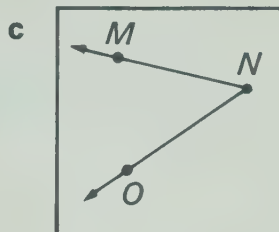
Name: Segment

Symbol: \overline{RS}



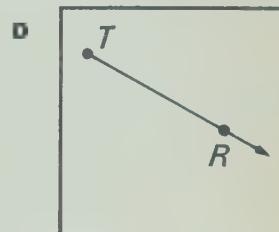
Name: _____

Symbol: _____



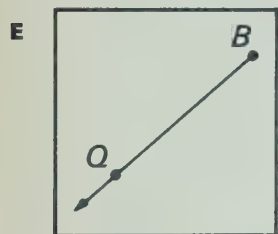
Name: _____

Symbol: _____



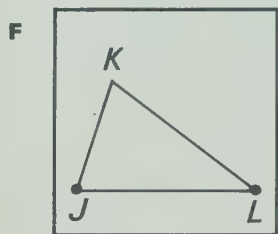
Name: _____

Symbol: _____



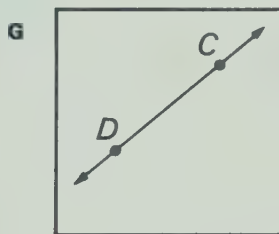
Name: _____

Symbol: _____



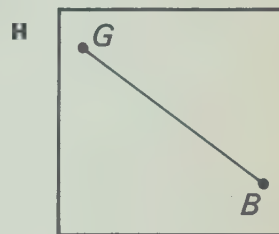
Name: _____

Symbol: _____



Name: _____

Symbol: _____



Name: _____

Symbol: _____

2. In each box, draw and label a figure for each symbol.

$\angle CDE$	\overline{NP}	\overrightarrow{RS}
$\triangle PQR$	\overleftrightarrow{ST}	\overrightarrow{BA}

Study the steps in the exercises below. Then draw the space figures in the space provided at the right.

1. Cube

Draw a square.

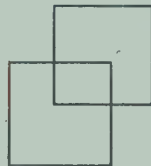


Draw another square.



Connect the corners. Dot the hidden edges.

Draw a cube here.



2. Triangular Pyramid

Draw a triangle.

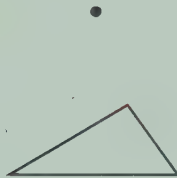


Draw a dot above it.



Connect the dot to the corners. Dot the hidden edges.

Draw a triangular pyramid here.



3. Cone

Draw an oval.

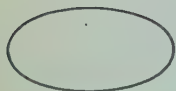


Draw a dot above it.



Connect the dot to the oval. Dot the hidden edge.

Draw a cone here.



4. Cylinder

Draw an oval.

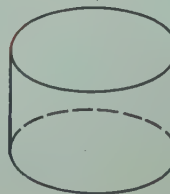
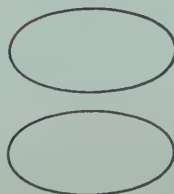


Draw another oval.



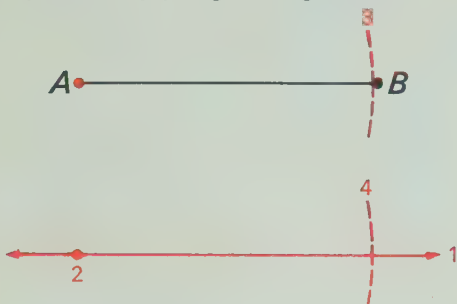
Connect the ovals. Dot the hidden edge.

Draw a cylinder here.



Study the examples in each exercise before trying to do the constructions. The colored dots show where to put your compass point, and the colored numerals show the order of construction.

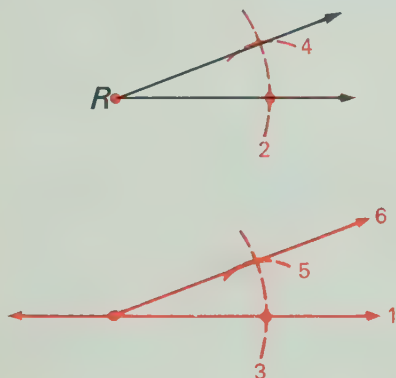
1. Example: Copying a segment



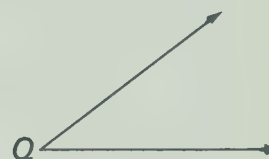
Copy \overline{XY} .



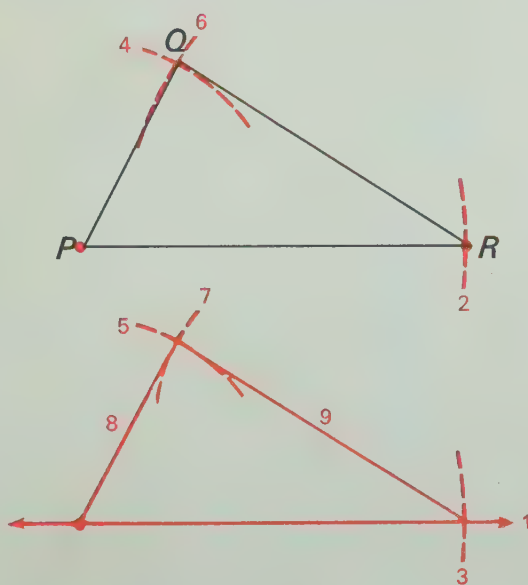
2. Example: Copying an angle



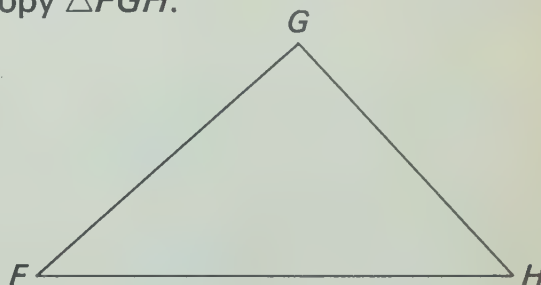
Copy $\angle Q$.



3. Example: Copying a triangle

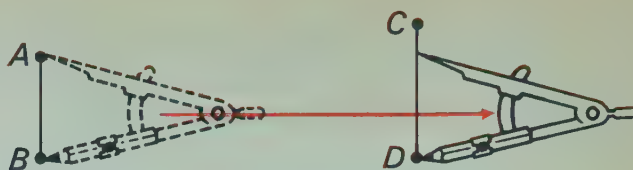


Copy $\triangle FGH$.

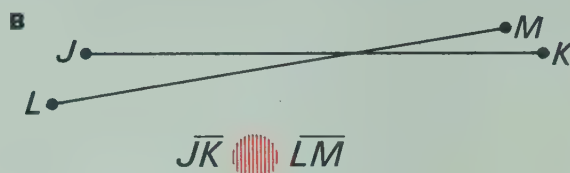


1. Two segments are **congruent** (\cong) if their end points are equally far apart.

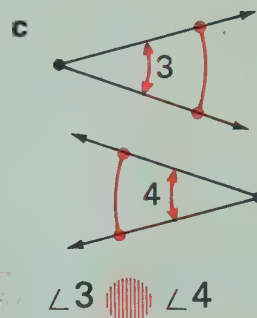
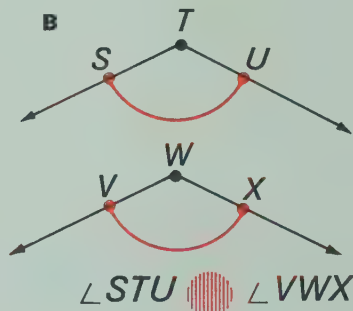
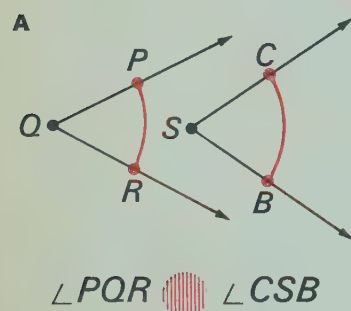
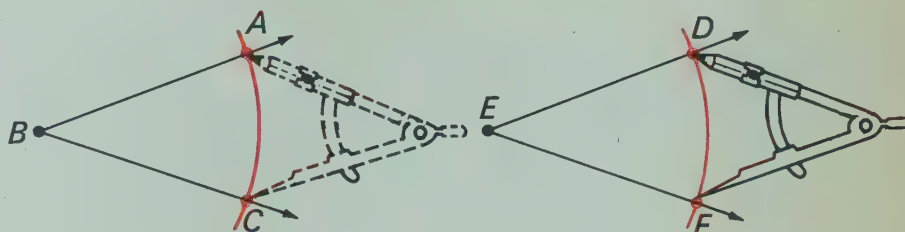
Is $\overline{AB} \cong \overline{CD}$? _____



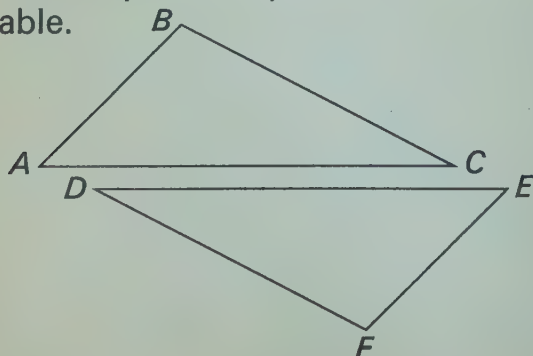
2. In each part, use your compass to find out whether or not the two segments are congruent. Write \cong or $\not\cong$ (not congruent) in each .



3. Two angles are **congruent** if "corresponding points" on their rays are equally far apart. Use your compass to find out whether or not the two angles are congruent. Write \cong or $\not\cong$ in each .



4. Two triangles are **congruent** if the parts (angles and segments) of one can be matched with the parts of the other. Use your compass and tracing paper to tell which parts of $\triangle ABC$ and $\triangle DEF$ are congruent to each other as you complete the table.

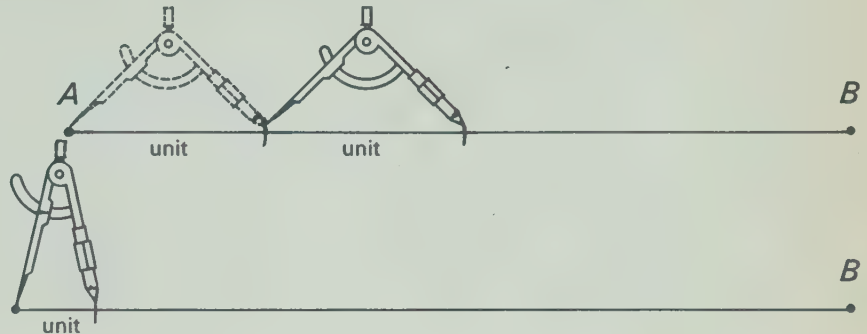


This part of triangle ABC	this part of triangle DEF .
\overline{AB}	\overline{DE}
\overline{AC}	\overline{DF}
\overline{BC}	\overline{EF}
$\angle CAB$	$\angle FDE$
$\angle CBA$	$\angle FED$
$\angle ACB$	$\angle EDF$

1. You can find the **length** of a segment by marking off segments congruent to a given unit and then counting the units. In each part, use your compass to mark off on \overline{AB} as many segments congruent to the unit as you can. Then write the length of \overline{AB} (to the nearest unit) in each blank.

A Unit: _____

Length: _____



B Unit: _____

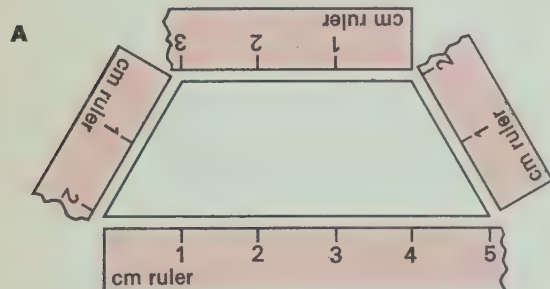
Length: _____

C Unit: _____

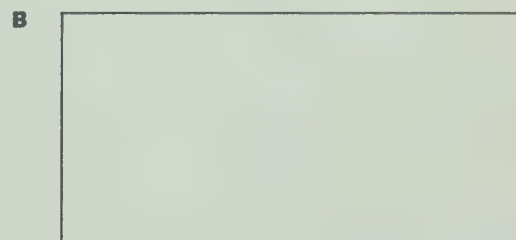
Length: _____



2. You can think of **perimeter** of a closed figure as the "distance around" the figure. In each part, find the perimeter in centimetres.



Perimeter: _____ cm



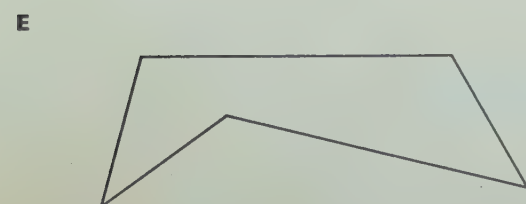
Perimeter: _____ cm



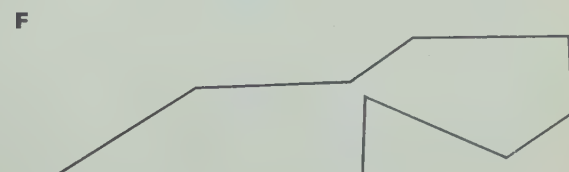
Perimeter: _____ cm



Perimeter: _____ cm



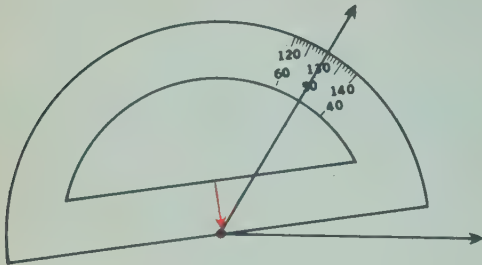
Perimeter: _____ cm



Perimeter: _____ cm

Each exercise shows an **incorrect** procedure to measure an angle. Use your protractor to give the **correct** measure.

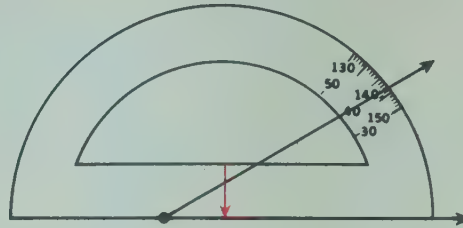
1.



The answer 50° is **incorrect**.

The correct measure is _____.

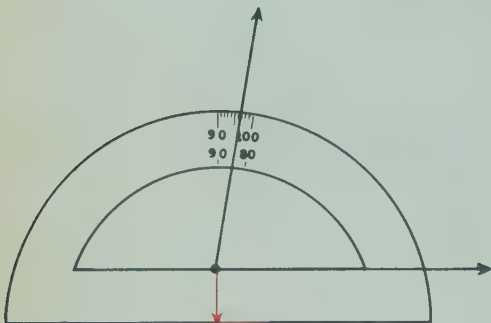
2.



The answer 40° is **incorrect**.

The correct measure is _____.

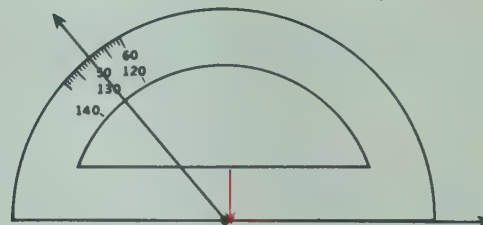
3.



The answer 84° is **incorrect**.

The correct measure is _____.

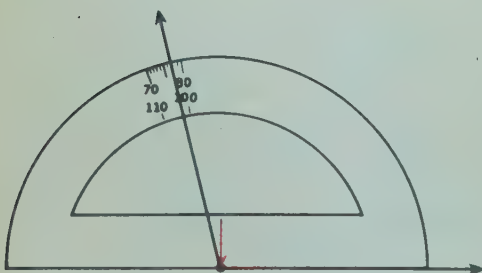
4.



The answer 50° is **incorrect**.

The correct measure is _____.

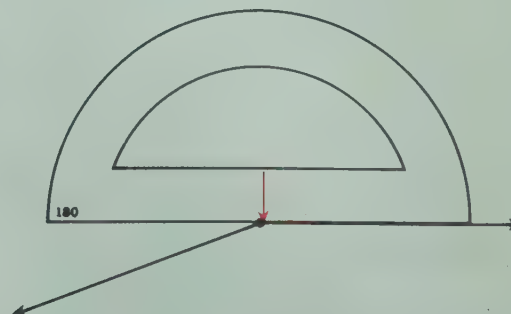
5.



The answer 100° is **incorrect**.

The correct measure is _____.

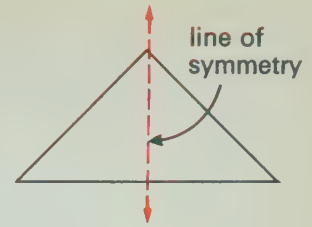
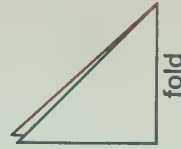
6.



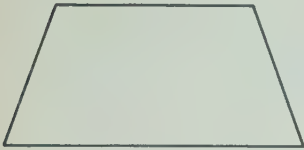
The answer "less than 180° " is **incorrect**.

The correct measure is _____.

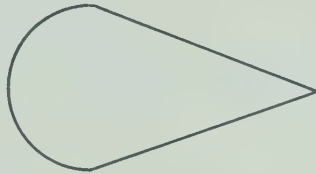
1. To find a **line of symmetry** of a figure, think about folding it in half so that the two halves match exactly. Draw the line of symmetry for each figure below.



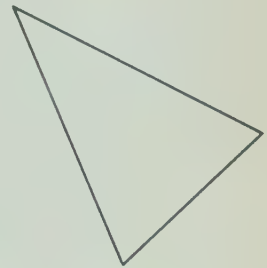
A



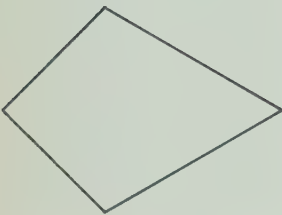
B



C



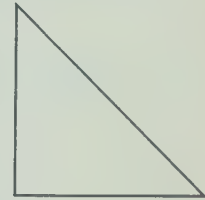
D



E

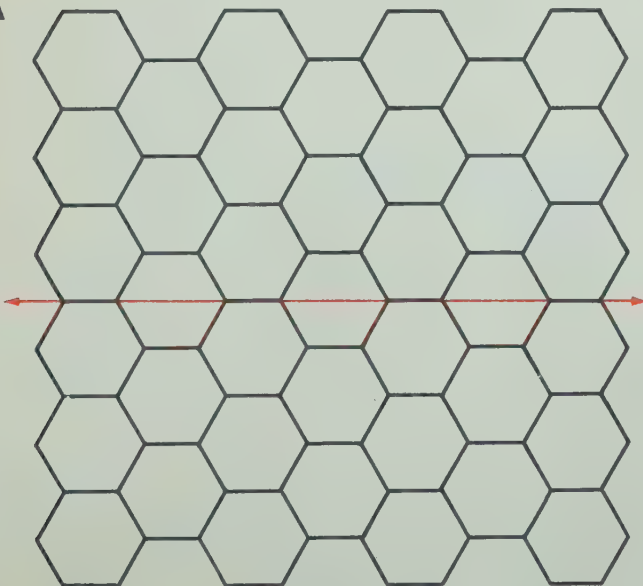


F

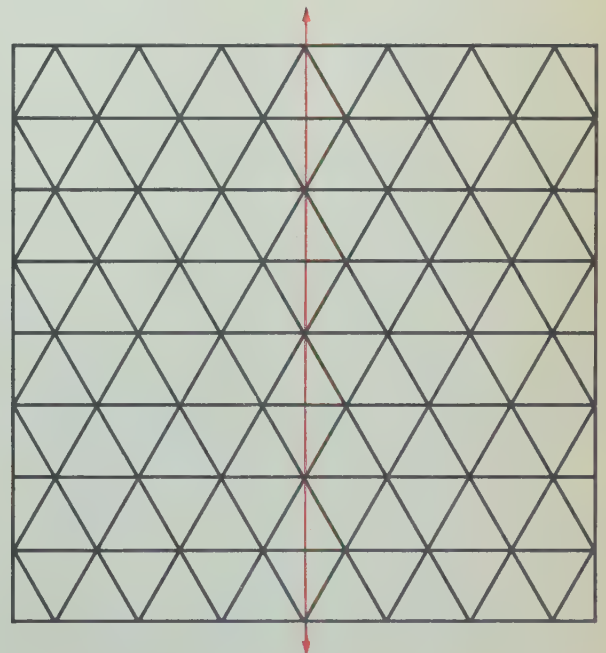


2. Use two different colors to color each tessellation so that the red line is the line of symmetry for each tessellation.

A



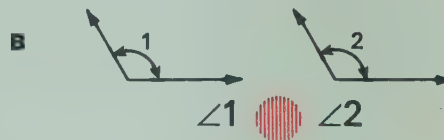
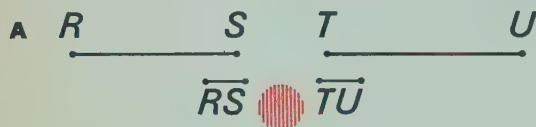
B



1. In each box, draw and label a figure for each symbol.

\overline{RZ}	\overrightarrow{DC}	$\angle RST$	$\triangle KLM$
-----------------	-----------------------	--------------	-----------------

2. Write \cong or $\not\cong$ in each to tell whether the figures are congruent.

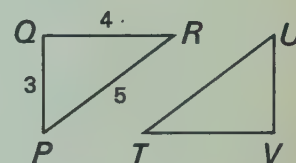


3. In exercise 2,

A the length of \overline{TU} is _____ centimetres. B the measure of $\angle 1$ is _____ degrees.

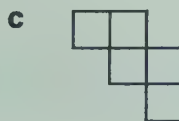
4. Triangles PQR and UVT are congruent. Complete the statements.

A $\overline{PQ} \cong$ _____ B $\overline{QR} \cong$ _____ C $\angle TVU \cong$ _____



5. In exercise 4, the perimeter of $\triangle PQR$ is _____ units.

6. Draw a line of symmetry for each of these pentomino pieces.



CHANGE OF PACE

1. $1 + 2 = (2 \times 3) \div 2 =$ _____

2. $1 + 2 + 3 = (3 \times 4) \div 2 =$ _____

3. $1 + 2 + 3 + 4 = (4 \times 5) \div 2 =$ _____

4. $1 + 2 + 3 + 4 + 5 = (5 \times 6) \div 2 =$ _____

5. $1 + 2 + 3 + 4 + 5 + 6 = (6 \times 7) \div 2 =$ _____



6. $1 + 2 + 3 + 4 + 5 + 6 + 7 = (\text{ } \times \text{ }) \div 2 =$ _____

7. $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = (\text{ } \times \text{ }) \div 2 =$ _____

8. $1 + 2 + 3 + 4 + \dots + 48 + 49 + 50 = (\text{ } \times \text{ }) \div 2 =$ _____



9. $1 + 2 + 3 + 4 + \dots + 96 + 97 + 98 + 99 + 100 = (\text{ } \times \text{ }) \div 2 =$ _____

Complete exercises 1 through 5. Then check each sum to be sure the answer is correct. Finally, use the same idea to find the last four sums.

1. A In example A, write digits in each  so that the digit in the  is 3.

$$\begin{array}{r} \text{A} \quad 35 \\ + 28 \\ \hline 6 \end{array}$$

$$\begin{array}{r} \text{B} \quad 35 \\ + 28 \\ \hline 6 \end{array}$$

- B In example B, write digits in each  so that the digit in the  is 4.

2. Give the missing numbers in the screens. Then find the sums.

$$\begin{array}{r} \text{A} \quad 65 \rightarrow 60 + 5 \\ + 27 \rightarrow 20 + 7 \\ \hline \leftarrow \quad + \end{array}$$

$$\begin{array}{r} \text{B} \quad 93 \rightarrow 90 + 3 \\ + 39 \rightarrow 30 + 9 \\ \hline \leftarrow \quad + \end{array}$$

$$\begin{array}{r} \text{C} \quad 453 \rightarrow 400 + 50 + 3 \\ + 874 \rightarrow 800 + 70 + 4 \\ \hline \leftarrow \quad + \quad + \end{array}$$

3. Find the sums.

$$\begin{array}{r} \text{A} \quad 68 \\ + 24 \\ \hline \end{array}$$



$$\begin{array}{r} \text{B} \quad 39 \\ + 75 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C} \quad 83 \\ + 29 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D} \quad 416 \\ + 897 \\ \hline \end{array}$$



$$\begin{array}{r} \text{E} \quad 398 \\ + 425 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F} \quad 2075 \\ + 944 \\ \hline \end{array}$$

4. A In example A, write digits in each  so that the digit in the  is 3.

$$\begin{array}{r} \text{A} \quad 67 \\ - 34 \\ \hline 3 \end{array}$$

$$\begin{array}{r} \text{B} \quad 67 \\ - 34 \\ \hline 3 \end{array}$$

- B In example B, write digits in each  so that the digit in the  is 2.

5. Give the missing numbers. Then find the differences.

$$\begin{array}{r} \text{A} \quad 53 \rightarrow 50 + 3 \rightarrow 40 + \quad \\ - 27 \rightarrow - (20 + 7) \rightarrow - (20 + 7) \\ \hline \quad + \end{array}$$

$$\begin{array}{r} \text{B} \quad 806 \rightarrow 800 + 0 + 6 \rightarrow \quad + 100 + 6 \\ - 394 \rightarrow - (300 + 90 + 4) \rightarrow - (300 + 90 + 4) \\ \hline \quad + \quad + \end{array}$$

6. Find the differences.

$$\begin{array}{r} \text{A} \quad 92 \\ - 48 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B} \quad 623 \\ - 419 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C} \quad 745 \\ - 396 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D} \quad 901 \\ - 725 \\ \hline \end{array}$$

$$\begin{array}{r} \text{E} \quad 805 \\ - 338 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F} \quad 4078 \\ - 1499 \\ \hline \end{array}$$

1. Find the total amounts.

$$\begin{array}{r} \text{A } \$16.32 \\ 19.49 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B } \$52.83 \\ 27.95 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C } \$172.86 \\ 44.78 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D } \$348.98 \\ 652.37 \\ \hline \end{array}$$

$$\begin{array}{r} \text{E } \$500.19 \\ 278.88 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F } \$2.89 \\ 3.47 \\ 1.66 \\ \hline \end{array}$$

$$\begin{array}{r} \text{G } \$21.95 \\ 17.77 \\ 9.28 \\ \hline \end{array}$$

$$\begin{array}{r} \text{H } \$38.25 \\ 50.00 \\ 72.75 \\ \hline \end{array}$$

$$\begin{array}{r} \text{I } \$238.46 \\ 275.91 \\ 309.18 \\ \hline \end{array}$$

$$\begin{array}{r} \text{J } \$196.39 \\ 74.18 \\ 2.99 \\ \hline \end{array}$$

2. Find the difference in the amounts.

$$\begin{array}{r} \text{A } \$18.77 \\ 5.84 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B } \$32.90 \\ 17.65 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C } \$23.50 \\ 14.46 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D } \$53.00 \\ 49.95 \\ \hline \end{array}$$

$$\begin{array}{r} \text{E } \$10.00 \\ 1.89 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F } \$50.00 \\ 37.75 \\ \hline \end{array}$$

$$\begin{array}{r} \text{G } \$192.50 \\ 14.84 \\ \hline \end{array}$$

$$\begin{array}{r} \text{H } \$207.19 \\ 93.68 \\ \hline \end{array}$$

$$\begin{array}{r} \text{I } \$100.00 \\ 78.29 \\ \hline \end{array}$$

$$\begin{array}{r} \text{J } \$19.07 \\ 1.98 \\ \hline \end{array}$$

3. Solve each story problem.

- A Spent \$3.45.
Then spent \$6.23.

Spent how much in all? _____

- B Earned \$9.65.
Then earned \$4.75.

Total earnings? _____

- C Had \$16.56.
Spent \$3.75.

How much left? _____

- D Bought two \$3.98 records.
Gave clerk a \$20 bill.

How much change? _____

- E \$8.67. How many pennies? _____



- F 1367 pennies. Use dollar-and-cent notation to tell how much? _____

- G Had \$10.00. Spent \$2.50.
Then spent \$4.00.

How much left? _____

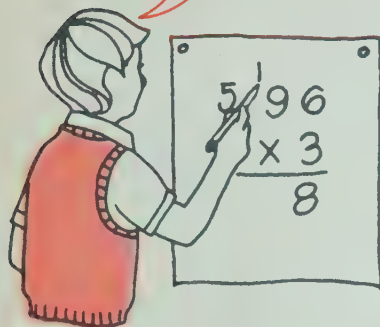
- H Earned 75¢ one day.
Earned \$1.35 the next day.

Total earnings? _____

1. Fill in the blanks to show what the boy is thinking.
Then study the way he writes it down.

Multiplying ones

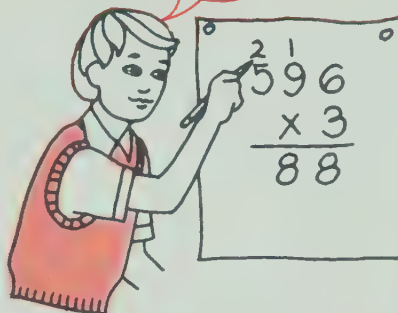
$$3 \times 6 = \underline{\quad}$$



Multiplying tens

$$3 \times 9 = \underline{\quad}$$

$$27 + 1 = \underline{\quad}$$



Multiplying hundreds

$$3 \times 5 = \underline{\quad}$$

$$15 + 2 = \underline{\quad}$$



2. Find the products.

A $\begin{array}{r} 54 \\ \times 3 \\ \hline \end{array}$

B $\begin{array}{r} 69 \\ \times 5 \\ \hline \end{array}$

C $\begin{array}{r} 38 \\ \times 6 \\ \hline \end{array}$

D $\begin{array}{r} 27 \\ \times 4 \\ \hline \end{array}$

E $\begin{array}{r} 90 \\ \times 8 \\ \hline \end{array}$

F $\begin{array}{r} 71 \\ \times 9 \\ \hline \end{array}$

G $\begin{array}{r} 234 \\ \times 2 \\ \hline \end{array}$

H $\begin{array}{r} 558 \\ \times 4 \\ \hline \end{array}$

I $\begin{array}{r} 678 \\ \times 5 \\ \hline \end{array}$

J $\begin{array}{r} 109 \\ \times 3 \\ \hline \end{array}$

K $\begin{array}{r} 998 \\ \times 8 \\ \hline \end{array}$

L $\begin{array}{r} 489 \\ \times 7 \\ \hline \end{array}$

M $\begin{array}{r} 2003 \\ \times 9 \\ \hline \end{array}$

N $\begin{array}{r} 5267 \\ \times 3 \\ \hline \end{array}$

O $\begin{array}{r} 8190 \\ \times 6 \\ \hline \end{array}$

P $\begin{array}{r} 1476 \\ \times 7 \\ \hline \end{array}$

Q $\begin{array}{r} 6005 \\ \times 3 \\ \hline \end{array}$

R $\begin{array}{r} 9991 \\ \times 9 \\ \hline \end{array}$

3. Fill the blanks.

A $4 \times 26 = \underline{\quad} \rightarrow 10 \times 4 \times 26 = \underline{\quad} \rightarrow 40 \times 26 = \underline{\quad}$

B $8 \times 54 = \underline{\quad} \rightarrow 10 \times 8 \times 54 = \underline{\quad} \rightarrow 80 \times 54 = \underline{\quad}$

4. Find the products.

A $\begin{array}{r} 38 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 38 \\ \times 40 \\ \hline \end{array}$

B $\begin{array}{r} 79 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 79 \\ \times 30 \\ \hline \end{array}$

C $\begin{array}{r} 463 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 463 \\ \times 40 \\ \hline \end{array}$ $\begin{array}{r} 463 \\ \times 400 \\ \hline \end{array}$

D $\begin{array}{r} 74 \\ \times 50 \\ \hline \end{array}$

E $\begin{array}{r} 27 \\ \times 40 \\ \hline \end{array}$

F $\begin{array}{r} 35 \\ \times 90 \\ \hline \end{array}$

G $\begin{array}{r} 545 \\ \times 200 \\ \hline \end{array}$

H $\begin{array}{r} 793 \\ \times 500 \\ \hline \end{array}$

I $\begin{array}{r} 218 \\ \times 600 \\ \hline \end{array}$

1. Find the products. Give the missing numbers in each

A $26 \times 54 = (26 \times 4) + (26 \times 50)$

$\begin{array}{r} 26 \\ \times 54 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 26 \\ \times 50 \\ \hline \end{array}$

B $647 \times 243 = (647 \times 3) + (647 \times 40) + (647 \times 200)$

$\begin{array}{r} 647 \\ \times 243 \\ \hline \end{array}$	$\begin{array}{r} 647 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 647 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 647 \\ \times 200 \\ \hline \end{array}$

2. Find the products.

A $\begin{array}{r} 386 \\ \times 3 \\ \hline \end{array}$ $\begin{array}{r} 386 \\ \times 60 \\ \hline \end{array}$ $\begin{array}{r} 386 \\ \times 200 \\ \hline \end{array}$ $\begin{array}{r} 386 \\ \times 263 \\ \hline \end{array}$

B $\begin{array}{r} 951 \\ \times 5 \\ \hline \end{array}$ $\begin{array}{r} 951 \\ \times 400 \\ \hline \end{array}$ $\begin{array}{r} 951 \\ \times 405 \\ \hline \end{array}$

3. Find the products.

A $\begin{array}{r} 84 \\ \times 23 \\ \hline \end{array}$

B $\begin{array}{r} 37 \\ \times 91 \\ \hline \end{array}$

C $\begin{array}{r} 56 \\ \times 45 \\ \hline \end{array}$

D $\begin{array}{r} 698 \\ \times 32 \\ \hline \end{array}$

E $\begin{array}{r} 571 \\ \times 63 \\ \hline \end{array}$

F $\begin{array}{r} 250 \\ \times 589 \\ \hline \end{array}$

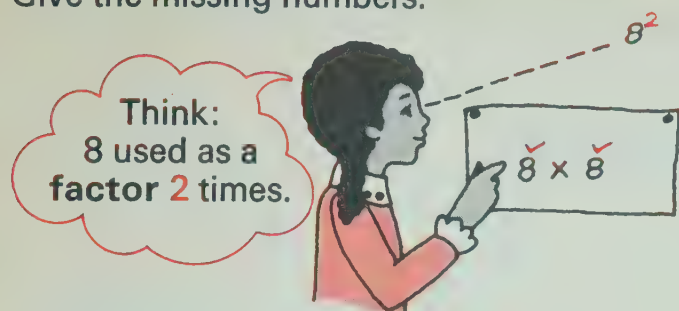
G $\begin{array}{r} 879 \\ \times 312 \\ \hline \end{array}$

H $\begin{array}{r} 206 \\ \times 207 \\ \hline \end{array}$

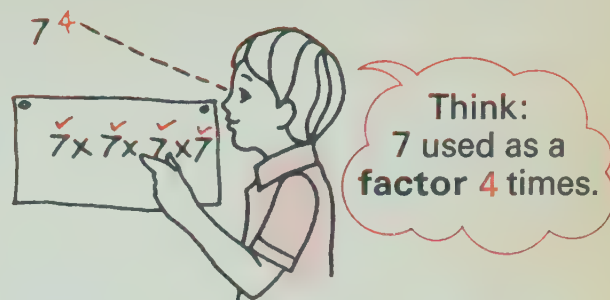
I $\begin{array}{r} 921 \\ \times 846 \\ \hline \end{array}$

J $\begin{array}{r} 7516 \\ \times 347 \\ \hline \end{array}$

1. Give the missing numbers.



$$8^2 = \underline{\quad} \times \underline{\quad} = \underline{\quad}$$



$$7^4 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$$

2. Give the missing numbers.

A 6^3 means that 6 is used as a factor $\underline{\quad}$ times.

$$6^3 = \underline{6 \times 6 \times 6} = \underline{\quad}$$

B 3^5 means that 3 is used as a factor $\underline{\quad}$ times.

$$3^5 = \underline{\quad} = \underline{\quad}$$

C 4^3 means that 4 is used as a factor $\underline{\quad}$ times.

$$4^3 = \underline{\quad} = \underline{\quad}$$

3. Write each of the following using an exponent.

A $3 \times 3 \times 3$ $\underline{\quad}$

B 7×7 $\underline{\quad}$

C $9 \times 9 \times 9 \times 9$ $\underline{\quad}$

D $10 \times 10 \times 10 \times 10 \times 10$ $\underline{\quad}$

E $5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$ $\underline{\quad}$

4. Give the missing numbers.

A $3^2 = \underline{\quad}$

C $8^3 = \underline{\quad}$

E $2^6 = \underline{\quad}$

G $7^4 = \underline{\quad}$

B $12^2 = \underline{\quad}$

D $3^3 = \underline{\quad}$

F $3^5 = \underline{\quad}$

H $9^3 = \underline{\quad}$

5. Write T (true) or F (false) in each blank.

A $4^2 = 8$ $\underline{\quad}$

C $2^2 \times 2 = 2^3$ $\underline{\quad}$

E $3^2 + 3^4 = 3^6$ $\underline{\quad}$

B $3^2 = 2^3$ $\underline{\quad}$

D $3^1 = 3$ $\underline{\quad}$

F $3^2 \times 3^4 = 3^6$ $\underline{\quad}$

1. For each step below, give the correct digit in each to show what the girl is thinking. Then study the way she writes the result. Finally, complete the check.

Step 1	Step 2
<p>Think about 57 hundreds</p> <p>$6 \overline{) 57} \text{ r } \square$</p>	<p>Think about 38 tens</p> <p>$6 \overline{) 38} \text{ r } \square$</p>
<p>Think about 29 ones</p> <p>$6 \overline{) 29} \text{ r } \square$</p>	<p>Check</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> $\begin{array}{r} 964 \\ \times 6 \\ \hline \end{array}$ </div> <div> $\begin{array}{r} \square\square\square\square \\ + 5 \\ \hline \end{array}$ </div> </div>

2. Find the quotients and remainders.

A $3 \overline{) 905} \text{ } 301 \text{ r } 2$

B $5 \overline{) 615}$

C $6 \overline{) 849}$

D $4 \overline{) 309}$

E $2 \overline{) 1930}$

F $4 \overline{) 3127}$

G $7 \overline{) 5601}$

H $5 \overline{) 2865}$

I $9 \overline{) 7408}$

J $6 \overline{) 4956}$

K $8 \overline{) 6578}$

L $3 \overline{) 2975}$

1. Find the quotients and remainders. Use the heavy black numerals to help you estimate the quotient.

A $83 \overline{)195}$

B $83 \overline{)298}$

C $83 \overline{)493}$

2. Use the quotients you found in exercise 1 to complete this dividing.

A **Dividing hundreds**
Think: $19500 \div 83$

B **Dividing tens**
Think: $2980 \div 83$

C **Dividing ones**
Think: $493 \div 83$

$$\begin{array}{r} 83 \overline{)19583} \\ \underline{166} \\ 29 \end{array}$$

$$\begin{array}{r} 83 \overline{)19583} \\ \underline{166} \\ 298 \\ \underline{249} \\ 49 \end{array}$$

$$\begin{array}{r} 83 \overline{)19583} \\ \underline{166} \\ 298 \\ \underline{249} \\ 493 \\ \underline{415} \\ 78 \end{array}$$

3. Find the quotients and remainders.

A $\overset{70}{\text{70}} \overline{)72)59346}$

B $\overset{90}{\text{90}} \overline{)91)72639}$

C $\overset{30}{\text{30}} \overline{)28)26075}$

D $\overset{50}{\text{50}} \overline{)47)28650}$

E $53 \overline{)49200}$

F $64 \overline{)19954}$

G $35 \overline{)3957}$

H $16 \overline{)12485}$

1. Complete the example.

Step 1

Dividing hundreds

Think: $154 \div 38$

$$\begin{array}{r} 38 \overline{) 15428} \\ \underline{} \end{array}$$

Step 2

Dividing tens

Think: $22 \div 38$

$$\begin{array}{r} 4 \\ 38 \overline{) 15428} \\ \underline{152} \\ 22 \end{array}$$

Step 3

Dividing ones

Think: $228 \div 38$

$$\begin{array}{r} 40 \\ 38 \overline{) 15428} \\ \underline{152} \\ 228 \\ \underline{228} \\ 0 \end{array}$$

2. Find the quotients and remainders.

A $62 \overline{) 49855}$

B $23 \overline{) 16263}$

C $49 \overline{) 36260}$

D $71 \overline{) 64105}$

E $34 \overline{) 18360}$

F $85 \overline{) 44510}$

G $67 \overline{) 42210}$

H $92 \overline{) 55936}$

I $24 \overline{) 2650}$

J $79 \overline{) 8095}$

K $315 \overline{) 3142}$

L $408 \overline{) 4027}$

1. Solve each story problem.

- A** Average speed: 56 km/h.
Travelled 4 hours.

Travelled how far? _____

- B** An airplane travelled 2335 km in 5 hours. What

was its average speed? _____

- C** Test scores: 87, 94, 76, 98, 96, and 83. What is the average score (to the nearest

whole number)? _____

- D** One block: 528 metres.
Five blocks.

How many m? _____

- E** Can pack 24 cans in a box.
How many boxes are needed

to pack 864 cans? _____

- F** Mr. Franey travelled 448 km and used 56 litres of gasoline.

How many km/l? _____

- G** One pail of water: 62 glasses.
How many glasses of water in

26 pails? _____

- H** Car A averages 46 km/h for 8 hours.
Car B averages 63 km/h for 6 hours.

Which car goes farther? _____

How much farther? _____

2. Find the products and quotients.

A
$$\begin{array}{r} \$2.75 \\ \times 6 \\ \hline \end{array}$$

B
$$\begin{array}{r} \$0.96 \\ \times 8 \\ \hline \end{array}$$

C
$$\begin{array}{r} \$3.79 \\ \times 5 \\ \hline \end{array}$$

D
$$\begin{array}{r} \$16.25 \\ \times 12 \\ \hline \end{array}$$

E
$$\begin{array}{r} \$350.00 \\ \times 28 \\ \hline \end{array}$$

F
$$6 \overline{) \$8.22}$$

G
$$8 \overline{) \$7.52}$$

H
$$\$.35 \overline{) \$12.60}$$

I
$$\$0.75 \overline{) \$66.00}$$

3. Solve each money problem.

- A** Total cost: \$33.12. Paid \$4.
Then pay the rest in 8 equal payments. How much is

each payment? _____

- C** Adult tickets: \$1.25 each.
Student tickets: \$0.75 each.
How much money would you collect if you sold 38 adult tickets and 26 student tickets?

- B** \$20.75. How many quarters? _____

1. Find the sums and differences.

A
$$\begin{array}{r} 65 \\ + 39 \\ \hline \end{array}$$

B
$$\begin{array}{r} 306 \\ + 194 \\ \hline \end{array}$$

C
$$\begin{array}{r} 598 \\ + 236 \\ \hline \end{array}$$

D
$$\begin{array}{r} 92 \\ - 18 \\ \hline \end{array}$$

E
$$\begin{array}{r} 835 \\ - 549 \\ \hline \end{array}$$

F
$$\begin{array}{r} 714 \\ - 346 \\ \hline \end{array}$$

2. Find the products and quotients.

A
$$\begin{array}{r} 253 \\ \times 84 \\ \hline \end{array}$$

B
$$\begin{array}{r} 709 \\ \times 315 \\ \hline \end{array}$$

C $6 \overline{)4753}$

D $34 \overline{)3092}$

E $516 \overline{)20640}$

3. Find the average (to the nearest whole number) of 86, 75, 64, and 93. _____

4. Mr. Jones kept this record of his trip.

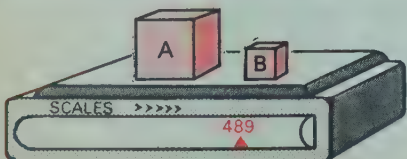
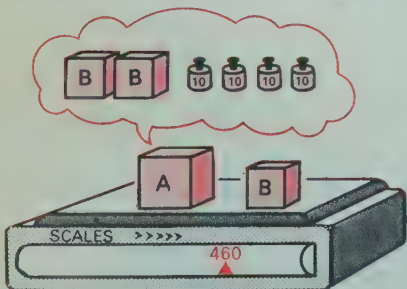
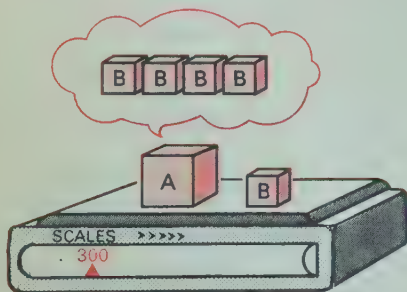
A What was his average speed? _____

B How many kilometres did he travel per litre of gasoline? _____

C What was the total cost of the gasoline? _____

km	Hours (driving time)	litres of gasoline	Cost of gasoline
360	9	72	18c /litre

CHANGE OF PACE



1. Block A weighs 4 times as much as block B. Together they weigh 300 grams.

A Block A weighs _____ g.

B Block B weighs _____ g.

2. Block A weighs 40 grams more than twice block B. Together blocks A and B weigh 460 grams.

A Block A weighs _____ g.

B Block B weighs _____ g.

3. Block A weighs 1 gram less than 6 times as much as block B. Together the blocks weigh 489 grams.

A Block A weighs _____ g.

B Block B weighs _____ g.

1. Whenever possible, give a whole number in each (F stands for factor. P stands for product.)

A

F	F	P
<input type="text"/>	$\times 1 =$	48
<input type="text"/>	$\times 2 =$	48
<input type="text"/>	$\times 3 =$	48
<input type="text"/>	$\times 4 =$	48
<input type="text"/>	$\times 5 =$	48
<input type="text"/>	$\times 6 =$	48

The factors of 48 are

B

F	F	P
<input type="text"/>	$\times 1 =$	42
<input type="text"/>	$\times 2 =$	42
<input type="text"/>	$\times 3 =$	42
<input type="text"/>	$\times 4 =$	42
<input type="text"/>	$\times 5 =$	42
<input type="text"/>	$\times 6 =$	42

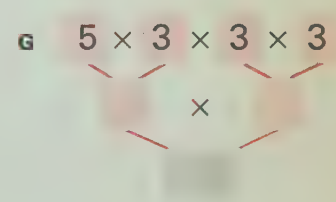
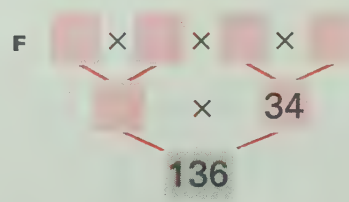
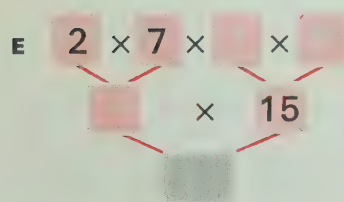
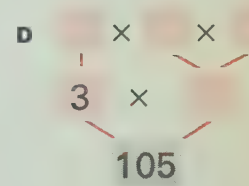
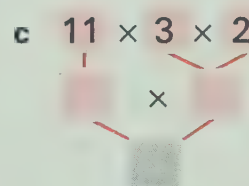
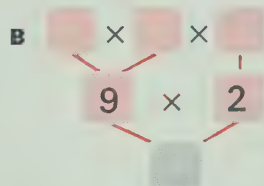
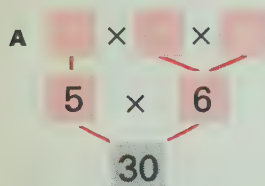
The factors of 42 are

C

F	F	P
<input type="text"/>	$\times 1 =$	47
<input type="text"/>	$\times 2 =$	47
<input type="text"/>	$\times 3 =$	47
<input type="text"/>	$\times 4 =$	47
<input type="text"/>	$\times 5 =$	47
<input type="text"/>	$\times 6 =$	47

The factors of 47 are

2. Give the missing factors and products.



3. List all the factors of each number.

A 18 _____

B 50 _____

C 81 _____

D 71 _____

E 96 _____

F 99 _____

1. **A** In the list of numbers at the right, mark out all the multiples of 2 that are greater than 2.
- B** Mark out all multiples of 3 that are greater than 3.
- C** Mark out all multiples of 5 that are greater than 5.
- D** Mark out all multiples of 7 that are greater than 7.
- E** Each number **not marked out** has **exactly 2 factors** (1 and the number itself) and is a **prime number** less than 100. List below the prime numbers less than 100.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

2. Numbers greater than 1 that are not prime can be written as the product of prime numbers.

For example, 24 can be written as the product $3 \times 2 \times 2 \times 2$.
The **prime factorization** of 24 is $3 \times 2 \times 2 \times 2$.

Give the missing prime number in each blank so that the prime factorization of each number is given.

A $4 = \underline{\quad} \times \underline{\quad}$

E $18 = 2 \times \underline{\quad} \times \underline{\quad}$

B $6 = \underline{\quad} \times \underline{\quad}$


F $20 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

C $8 = 2 \times \underline{\quad} \times \underline{\quad}$

G $22 = \underline{\quad} \times \underline{\quad}$

D $12 = 2 \times \underline{\quad} \times \underline{\quad}$

H $32 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times 2 \times \underline{\quad}$

3. Give the missing numbers in each .

A $16 = 2 \times \square$
 $\quad \quad \quad | \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $\quad \quad \quad 2 \times \square \times \square$
 $\quad \quad \quad | \quad \quad \quad | \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $16 = \square \times \square \times \square \times \square$

B $340 = \square \times 20$
 $\quad \quad \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $\quad \quad \quad \quad \quad \square \times \square$
 $\quad \quad \quad \quad \quad | \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $340 = \square \times \square \times \square \times \square$

C $56 = \square \times 8$
 $\quad \quad \quad | \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $\quad \quad \quad \square \times \square \times \square$
 $\quad \quad \quad | \quad \quad \quad | \quad \quad \quad \diagup \quad \quad \quad \diagdown$
 $56 = \square \times \square \times \square \times \square$

1. A List the factors of 24. $\rightarrow \{1, 2, 3, 4, 6, 8, 12, 24\}$
 B List the factors of 40. $\rightarrow \{ \quad \quad \quad \}$
 C List the common factors of 24 and 40. $\rightarrow \{ \quad \quad \quad \}$
 D The greatest common factor of 24 and 40 is $\underline{\quad}$.

2. A List the factors of 42. $\rightarrow \{ \quad \quad \quad \}$
 B List the factors of 56. $\rightarrow \{ \quad \quad \quad \}$
 C List the common factors of 42 and 56. $\rightarrow \{ \quad \quad \quad \}$
 D The greatest common factor of 42 and 56 is $\underline{\quad}$.

3. You can use the prime factorizations of two numbers to find the greatest common factor of the two numbers. Study the example. Then give the GCF (greatest common factor) of each pair of numbers whose prime factorizations are given below.

$$18 = 2 \times 3 \times 3 \leftarrow \text{Prime factorization of 18}$$

$$24 = 2 \times 2 \times 2 \times 3 \leftarrow \text{Prime factorization of 24}$$

The greatest factor these products have in common is 2×3 or 6.

The GCF of 18 and 24 is 6.

A $12 = 2 \times 2 \times 3$
 $20 = 2 \times 2 \times 5$
 GCF of 12 and 20 is $\underline{\quad}$.

B $90 = 3 \times 3 \times 2 \times 5$
 $24 = 2 \times 2 \times 2 \times 3$
 GCF of 90 and 24 is $\underline{\quad}$.

4. Give the prime factorizations of each number. Then find the GCF of the two numbers.

A $70 = 2 \times \underline{\quad} \times \underline{\quad}$
 $28 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 GCF of 70 and 28 is $\underline{14}$.

B $36 = 2 \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 $60 = 2 \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 GCF of 36 and 60 is $\underline{\quad}$.

C $105 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 $42 = \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 GCF of 105 and 42 is $\underline{\quad}$.

D $210 = 3 \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 $126 = 7 \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$
 GCF of 210 and 126 is $\underline{\quad}$.

5. A What is the GCF of 48 and 32? $\underline{\quad}$ B What is the GCF of 36 and 54? $\underline{\quad}$

1. A List the multiples (to 70) of 10. → {**10, 20, 30, 40, 50, 60, 70**}
- B List the multiples (to 72) of 12. → { }
- C List the **common multiples** of 10 and 12. → { }
- D The **LCM** (least common multiple) of 10 and 12 is _____.

2. A List the multiples (to 64) of 8. → { }
- B List the multiples (to 70) of 14. → { }
- C List the common multiples of 8 and 14. → { }
- D The LCM of 8 and 14 is _____.

3. In the example below, multiples of 8 (other than 0) were listed until one was found that was also a multiple of 6.

Example: Finding the least common multiple (LCM) of 8 and 6

Multiples of 8 { 8, 16, 24, . . . }

Is this multiple of 8
also a multiple of 6?

↑
No

↑
No

↑
Yes

The LCM of 8 and 6 is _____.

In each exercise below, list only the multiples necessary to find the LCM of the two numbers.

- A Multiples of 10 → { **10, 20,** . . . } The LCM of 10 and 6 is _____.

What is the first multiple of 10
that is also a multiple of 6?

- B Multiples of 16 → { . . . } The LCM of 16 and 6 is _____.

What is the first multiple of 16
that is also a multiple of 6?

- C Multiples of 18 → { . . . } The LCM of 18 and 10 is _____.

What is the first multiple of 18
that is also a multiple of 10?

4. Complete the prime factorization of each number.
Then give the LCM of the two numbers.

A $27 = 3 \times 3 \times \square$
 $18 = 3 \times \square \times 2$
 LCM = $\square \times \square \times \square \times \square = \underline{\hspace{2cm}}$

B $12 = 2 \times \square \times 3$
 $15 = \square \times \square \times \square$
 LCM = $\square \times \square \times \square \times \square = \underline{\hspace{2cm}}$

Complete each exercise by giving the missing numbers and drawing the hand on the clock in the proper position when it is missing.

1. Start at 12



Move forward
5
5



+

Move forward
9
9



=

Where is the hand now?

↓
2

2. Start at 12



Move forward
8
8



-

Move backward
11
11



=

Where is the hand now?

↓

3. Start at 12



Move forward
7
3



×

Move forward
7
7



=

Move forward
7



4. Start at 0



Move forward
3
3



+

Move forward
4
4

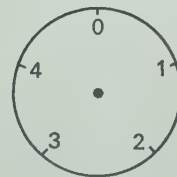


=

5. Start at 0

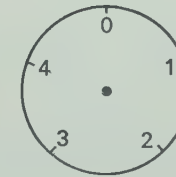


Move forward
2
2



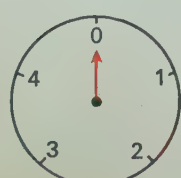
-

Move backward
3
3



=

6. Start at 0

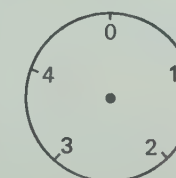


Move forward
4
3



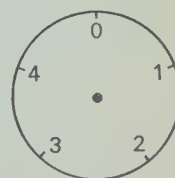
×

Move forward
4
4



=

Move forward
4



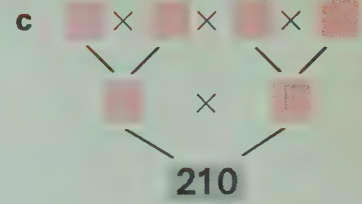
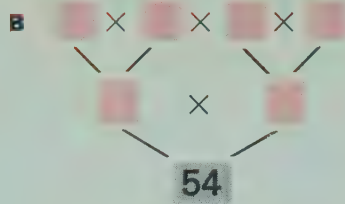
1. Complete the exercises.

A

F	F	P
\square	\times 1	= 18
\square	\times 2	= 18
\square	\times 3	= 18

The factors of 18 are

_____.



2. List the prime numbers between 1 and 20.

3. The greatest common factor of 54 and 90 is _____.

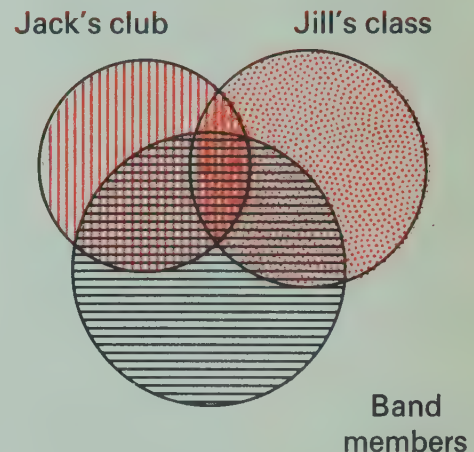
4. The least common multiple of 8 and 10 is _____.

CHANGE OF PACE

The region shaded like this → represents the pupils in Jack's club.

The region shaded like this → represents the pupils in Jill's class.

The region shaded like this → represents the band members.



1. Draw a line to match each region with the group of pupils it represents.



Pupils in Jill's class and in Jack's club, but not in the band.

Pupils in Jack's club and in the band, but not in Jill's class.

Pupils in Jill's class and in the band, but not in Jack's club.

Pupils in Jill's class, in Jack's club, and in the band.

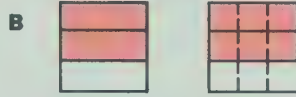
2. Jill's class has 24 pupils. Jack's club has 15 members. When Jill's class and Jack's club meet together, there are 35 people. How can you explain this?

1. A pair of fractions that suggest the same number of objects in a set or the same part of an object are called **equivalent fractions**.

Give a pair of equivalent fractions suggested by each picture.



is equivalent to

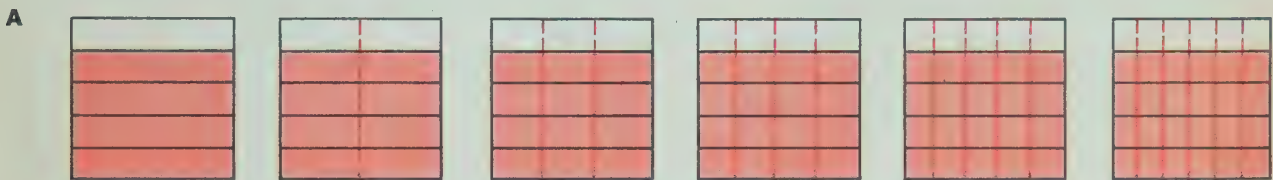


is equivalent to

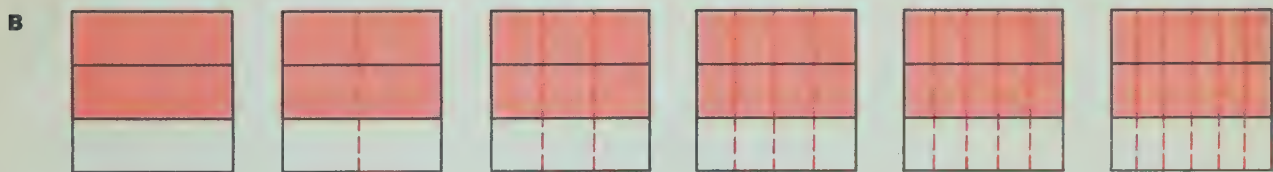


is equivalent to

2. In each row the fractions suggested by the figures are equivalent to each other. Give these fractions



$\frac{4}{5}$



$$\frac{1 \times 2}{1 \times 3}$$

$$\frac{2 \times 2}{2 \times 3}$$

$$\frac{3 \times 2}{3 \times 3}$$

$$\frac{4 \times 2}{4 \times 3}$$

$$\frac{5 \times 2}{5 \times 3}$$

$$\frac{6 \times 2}{6 \times 3}$$



3. For each exercise, give 6 fractions that are equivalent to the fraction given.

A $\left\{ \frac{1}{7}, \frac{2}{14}, \quad, \quad, \quad, \quad, \quad \right\}$

C $\left\{ \frac{5}{9}, \quad, \quad, \quad, \quad, \quad \right\}$

B $\left\{ \frac{7}{10}, \quad, \quad, \quad, \quad, \quad \right\}$

D $\left\{ \frac{3}{8}, \quad, \quad, \quad, \quad, \quad \right\}$

1. When the numerator and denominator of a fraction have no common factor other than 1, the fraction is a **lowest-terms** fraction.

In each part, give the factors of the numerator. Then give the factors of the denominator. Then circle the fraction if it is in lowest terms.

A $\frac{15}{26}$ { $\frac{1, 3, 5, 15}{1, 2, 13, 26}$ }

D $\frac{30}{75}$ { _____ }

B $\frac{16}{21}$ { _____ }

E $\frac{15}{60}$ { _____ }

C $\frac{18}{24}$ { _____ }

F $\frac{9}{28}$ { _____ }

2. To find the lowest-terms fraction, you can "divide out" common factors. Give the missing numbers in the fractions below.

A $\frac{15}{18} \rightarrow \frac{15 \div 3}{18 \div 3} \rightarrow$ _____

C $\frac{30}{75} \rightarrow \frac{30 \div 5}{75 \div 5} \rightarrow$ _____ $\rightarrow \frac{6 \div 3}{15 \div 3} \rightarrow$ _____

B $\frac{21}{49} \rightarrow \frac{21 \div 7}{49 \div 7} \rightarrow$ _____

D $\frac{24}{36} \rightarrow \frac{24 \div 3}{36 \div 3} \rightarrow$ _____ $\rightarrow \frac{8 \div 4}{12 \div 4} \rightarrow$ _____

3. Give the lowest-terms fraction for each fraction.

A $\frac{6}{8}$ _____

D $\frac{8}{18}$ _____

G $\frac{6}{9}$ _____

J $\frac{4}{16}$ _____

M $\frac{9}{30}$ _____

B $\frac{5}{10}$ _____

E $\frac{15}{25}$ _____

H $\frac{14}{49}$ _____

K $\frac{10}{100}$ _____

N $\frac{7}{35}$ _____

C $\frac{3}{15}$ _____

F $\frac{25}{75}$ _____

I $\frac{12}{72}$ _____

L $\frac{12}{28}$ _____

O $\frac{24}{64}$ _____

For each set of equivalent fractions



we think of **one fractional number**



and **one point** on the number line.

$\{\frac{3}{8}, \frac{6}{16}, \frac{9}{24}, \frac{12}{32}, \dots\}$



1. For each set of equivalent fractions there is one fractional number. Put a ring around the number-line point for that fractional number.

A $\{\frac{1}{6}, \frac{2}{12}, \frac{3}{18}, \frac{4}{24}, \dots\}$



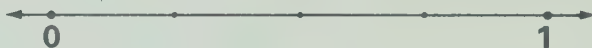
B $\{\frac{3}{5}, \frac{6}{10}, \frac{9}{15}, \frac{12}{20}, \dots\}$



C $\{\frac{1}{3}, \frac{2}{6}, \frac{3}{9}, \frac{4}{12}, \dots\}$



D $\{\frac{1}{4}, \frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \dots\}$



E $\{\frac{7}{8}, \frac{14}{16}, \frac{21}{24}, \frac{28}{32}, \dots\}$



F $\{\frac{3}{10}, \frac{6}{20}, \frac{9}{30}, \frac{12}{40}, \dots\}$



G $\{\frac{5}{6}, \frac{10}{12}, \frac{15}{18}, \frac{20}{24}, \dots\}$



2. In each exercise there is just one fractional number for the point over the colored arrow. Give four fractions from the set of equivalent fractions for this number. The first fraction in the set should be a lowest-terms fraction.

A $\{\frac{3}{4}, \frac{6}{8}, \frac{9}{12}, \frac{12}{16}, \dots\}$



B $\{\underline{\hspace{2cm}}, \dots\}$



C $\{\underline{\hspace{2cm}}, \dots\}$



D $\{\underline{\hspace{2cm}}, \dots\}$



E $\{\underline{\hspace{2cm}}, \dots\}$



● A Check for Equivalent Fractions

$$\left. \begin{array}{l} \begin{array}{c} 2 \quad 6 \\ \diagdown \quad \diagup \\ 5 \quad 15 \end{array} \rightarrow 5 \times 6 = 30 \\ \begin{array}{c} 5 \quad 15 \\ \diagup \quad \diagdown \\ 2 \quad 6 \end{array} \rightarrow 2 \times 15 = 30 \end{array} \right\}$$

These "cross products" are the same.


$\frac{2}{5}$ is equivalent to $\frac{6}{15}$.
We write $\frac{2}{5} = \frac{6}{15}$.


$$\left. \begin{array}{l} \begin{array}{c} 2 \quad 8 \\ \diagdown \quad \diagup \\ 3 \quad 10 \end{array} \rightarrow 3 \times 8 = 24 \\ \begin{array}{c} 3 \quad 10 \\ \diagup \quad \diagdown \\ 2 \quad 8 \end{array} \rightarrow 2 \times 10 = 20 \end{array} \right\}$$


These "cross products" are **not** the same.


$\frac{2}{3}$ is not equivalent to $\frac{8}{10}$.
We write $\frac{2}{3} \neq \frac{8}{10}$.

1. Find the products. Then give the correct sign (= or \neq) in each .

$$\text{A } \left. \begin{array}{l} \begin{array}{c} 5 \quad 5 \\ \diagdown \quad \diagup \\ 8 \quad 6 \end{array} \rightarrow 8 \times 5 = \underline{\hspace{2cm}} \\ \begin{array}{c} 8 \quad 6 \\ \diagup \quad \diagdown \\ 5 \quad 5 \end{array} \rightarrow 5 \times 6 = \underline{\hspace{2cm}} \end{array} \right\} \frac{5}{8} \text{  } \frac{5}{6}$$

$$\text{C } \left. \begin{array}{l} \begin{array}{c} 5 \quad 20 \\ \diagdown \quad \diagup \\ 6 \quad 24 \end{array} \rightarrow 6 \times 20 = \underline{\hspace{2cm}} \\ \begin{array}{c} 6 \quad 24 \\ \diagup \quad \diagdown \\ 5 \quad 20 \end{array} \rightarrow 5 \times 24 = \underline{\hspace{2cm}} \end{array} \right\} \frac{5}{6} \text{  } \frac{20}{24}$$

$$\text{B } \left. \begin{array}{l} \begin{array}{c} 3 \quad 4 \\ \diagdown \quad \diagup \\ 4 \quad 3 \end{array} \rightarrow 4 \times 4 = \underline{\hspace{2cm}} \\ \begin{array}{c} 4 \quad 3 \\ \diagup \quad \diagdown \\ 3 \quad 4 \end{array} \rightarrow 3 \times 3 = \underline{\hspace{2cm}} \end{array} \right\} \frac{3}{4} \text{  } \frac{4}{3}$$


$$\text{D } \left. \begin{array}{l} \begin{array}{c} 4 \quad 10 \\ \diagdown \quad \diagup \\ 6 \quad 15 \end{array} \rightarrow 6 \times 10 = \underline{\hspace{2cm}} \\ \begin{array}{c} 6 \quad 15 \\ \diagup \quad \diagdown \\ 4 \quad 10 \end{array} \rightarrow 4 \times 15 = \underline{\hspace{2cm}} \end{array} \right\} \frac{4}{6} \text{  } \frac{10}{15}$$

2. Give the correct sign (= or \neq) in each .


A $\frac{3}{6} \text{  } \frac{4}{8}$

D $\frac{9}{15} \text{  } \frac{3}{5}$

G $\frac{5}{6} \text{  } \frac{7}{8}$

J $\frac{4}{3} \text{  } \frac{20}{15}$


B $\frac{1}{3} \text{  } \frac{3}{12}$

E $\frac{3}{7} \text{  } \frac{13}{17}$

H $\frac{12}{15} \text{  } \frac{20}{25}$

K $\frac{5}{9} \text{  } \frac{10}{36}$


C $\frac{8}{12} \text{  } \frac{3}{4}$

F $\frac{8}{14} \text{  } \frac{16}{21}$


I $\frac{10}{7} \text{  } \frac{20}{21}$


L $\frac{36}{40} \text{  } \frac{9}{10}$


3. Give the missing numerator or denominator for each pair of equivalent fractions.

A $\frac{7}{8} = \frac{\text{}{40}$


D $\frac{\text{}{5} = \frac{24}{30}$


G $\frac{5}{10} = \frac{\text{}{50}$


J $\frac{10}{18} = \frac{\text{}{27}$


B $\frac{1}{2} = \frac{12}{\text{}$

E $\frac{1}{\text{}} = \frac{9}{54}$


H $\frac{7}{1} = \frac{21}{\text{}$

K $\frac{25}{30} = \frac{\text{}{48}$

C $\frac{3}{20} = \frac{\text{}{100}$

F $\frac{10}{30} = \frac{20}{\text{}$

I $\frac{5}{3} = \frac{25}{\text{}$

L $\frac{24}{36} = \frac{6}{\text{}}$

1. Give the correct numerator or denominator in each .
Then write the correct sign ($<$ or $>$) in the .

A $\left. \begin{array}{l} \frac{3}{4} = \frac{\quad}{12} \\ \frac{2}{3} = \frac{\quad}{12} \end{array} \right\} \frac{3}{4} \quad \frac{2}{3}$

B $\left. \begin{array}{l} \frac{4}{9} = \frac{\quad}{18} \\ \frac{1}{2} = \frac{\quad}{18} \end{array} \right\} \frac{4}{9} \quad \frac{1}{2}$

C $\left. \begin{array}{l} \frac{1}{8} = \frac{\quad}{56} \\ \frac{1}{7} = \frac{\quad}{56} \end{array} \right\} \frac{1}{8} \quad \frac{1}{7}$

D $\left. \begin{array}{l} 6 = \frac{\quad}{4} \\ \frac{23}{4} = \frac{23}{4} \end{array} \right\} 6 \quad \frac{23}{4}$

E $\left. \begin{array}{l} \frac{2}{3} = \frac{10}{\quad} \\ \frac{3}{5} = \frac{9}{\quad} \end{array} \right\} \frac{2}{3} \quad \frac{3}{5}$

F $\left. \begin{array}{l} \frac{5}{8} = \frac{\quad}{24} \\ \frac{4}{6} = \frac{\quad}{24} \end{array} \right\} \frac{5}{8} \quad \frac{4}{6}$

G $\left. \begin{array}{l} \frac{1}{4} = \frac{\quad}{12} \\ \frac{1}{6} = \frac{\quad}{12} \end{array} \right\} \frac{1}{4} \quad \frac{1}{6}$

H $\left. \begin{array}{l} \frac{7}{5} = \frac{\quad}{35} \\ \frac{9}{7} = \frac{\quad}{35} \end{array} \right\} \frac{7}{5} \quad \frac{9}{7}$

I $\left. \begin{array}{l} \frac{8}{5} = \frac{\quad}{30} \\ \frac{10}{6} = \frac{\quad}{30} \end{array} \right\} \frac{8}{5} \quad \frac{10}{6}$

J $\left. \begin{array}{l} \frac{3}{5} = \frac{\quad}{20} \\ \frac{3}{4} = \frac{\quad}{20} \end{array} \right\} \frac{3}{5} \quad \frac{3}{4}$

K $\left. \begin{array}{l} \frac{5}{6} = \frac{10}{\quad} \\ \frac{3}{4} = \frac{9}{\quad} \end{array} \right\} \frac{5}{6} \quad \frac{3}{4}$

L $\left. \begin{array}{l} \frac{3}{7} = \frac{9}{\quad} \\ \frac{1}{3} = \frac{7}{\quad} \end{array} \right\} \frac{3}{7} \quad \frac{1}{3}$

M $\left. \begin{array}{l} \frac{4}{7} = \frac{\quad}{21} \\ \frac{2}{3} = \frac{\quad}{21} \end{array} \right\} \frac{4}{7} \quad \frac{2}{3}$

N $\left. \begin{array}{l} 5 = \frac{\quad}{5} \\ \frac{26}{5} = \frac{\quad}{5} \end{array} \right\} 5 \quad \frac{26}{5}$

O $\left. \begin{array}{l} \frac{7}{8} = \frac{\quad}{72} \\ \frac{6}{9} = \frac{\quad}{72} \end{array} \right\} \frac{7}{8} \quad \frac{6}{9}$

P $\left. \begin{array}{l} \frac{7}{3} = \frac{\quad}{12} \\ \frac{9}{4} = \frac{\quad}{12} \end{array} \right\} \frac{7}{3} \quad \frac{9}{4}$

Q $\left. \begin{array}{l} \frac{3}{8} = \frac{9}{\quad} \\ \frac{1}{3} = \frac{8}{\quad} \end{array} \right\} \frac{3}{8} \quad \frac{1}{3}$

R $\left. \begin{array}{l} 4 = \frac{\quad}{4} \\ \frac{15}{4} = \frac{15}{4} \end{array} \right\} 4 \quad \frac{15}{4}$

2. Solve each short story problem.

A 10 cm. $\frac{3}{4}$ decimetre.

Which is longer? _____

B 40 seconds. $\frac{3}{4}$ minute.

Which is longer? _____

C 16 weeks. $\frac{1}{4}$ year.

Which is longer? _____

D 18 eggs. 1 dozen eggs.

Which is more? _____

1. Give 6 fractions that are equivalent to the given fraction.

A $\left\{ \frac{4}{9}, \quad , \quad , \quad , \quad , \quad , \quad , \quad \right\}$

B $\left\{ \frac{4}{3}, \quad , \quad , \quad , \quad , \quad , \quad , \quad \right\}$

2. Give the lowest-terms fraction for each fraction.

A $\frac{12}{16}$

B $\frac{10}{14}$

C $\frac{9}{24}$

D $\frac{16}{52}$

E $\frac{25}{55}$

3. Ring the number-line point for the fractional number indicated by the set of equivalent fractions.

$\left\{ \frac{5}{8}, \frac{10}{16}, \frac{15}{24}, \frac{20}{32}, \dots \right\}$



4. Give the lowest-terms fraction in the \quad for the point over the colored arrow. Then give the next 3 fractions in the set of equivalent fractions for this number.

$\left\{ \quad , \quad , \quad , \quad , \dots \right\}$



5. Give the missing numerators. Then give the correct sign ($<$ or $>$) in each \bullet .

A $\left. \begin{array}{l} \frac{3}{4} = \frac{\quad}{20} \\ \frac{4}{5} = \frac{\quad}{20} \end{array} \right\} \frac{3}{4} \bullet \frac{4}{5}$

B $\left. \begin{array}{l} \frac{6}{5} = \frac{\quad}{35} \\ \frac{8}{7} = \frac{\quad}{35} \end{array} \right\} \frac{6}{5} \bullet \frac{8}{7}$

6. Give the correct sign ($<$, $=$, or $>$) in each \bullet .

A $\frac{4}{8} \bullet \frac{9}{18}$

C $\frac{4}{7} \bullet \frac{4}{9}$

B $\frac{3}{9} \bullet \frac{1}{4}$

D $\frac{2}{3} \bullet \frac{18}{27}$

CHANGE OF PACE

Use parentheses (,) and any of the symbols $+$, $-$, \times , \div to make the following sentences true.

1. $(4 \bullet 4) \bullet 4 = 0$

6. $4 \bullet 4 \bullet 4 = 12$

2. $4 \bullet 4 \bullet 4 = 2$

7. $4 \bullet 4 \bullet 4 = 20$

3. $4 \bullet 4 \bullet 4 = 3$

8. $4 \bullet 4 \bullet 4 = 32$

4. $4 \bullet 4 \bullet 4 = 4$

9. $4 \bullet 4 \bullet 4 = 64$

5. $4 \bullet 4 \bullet 4 = 5$

For each exercise, list as many equivalent fractions as you need to find two fractions with the same denominator. Then give the equivalent fractions in each and the sum or difference in each.

	Problem	Sets of equivalent fractions	Sum or difference
1.	$\frac{1}{4} + \frac{3}{5}$	$\left\{ \frac{1}{4}, \frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \frac{5}{20} \right\}$ $\left\{ \frac{3}{5}, \frac{6}{10}, \frac{9}{15}, \frac{12}{20} \right\}$	$\frac{5}{20} + \frac{12}{20} = \frac{17}{20}$
2.	$\frac{5}{8} + \frac{5}{6}$	$\left\{ \frac{5}{8}, \frac{5}{8} \right\}$ $\left\{ \frac{5}{6}, \frac{5}{6} \right\}$	$\frac{5}{8} + \frac{5}{6} =$
3.	$\frac{4}{3} - \frac{3}{4}$	$\left\{ \frac{4}{3}, \frac{4}{3} \right\}$ $\left\{ \frac{3}{4}, \frac{3}{4} \right\}$	$\frac{4}{3} - \frac{3}{4} =$
4.	$\frac{7}{8} - \frac{3}{5}$	$\left\{ \frac{7}{8}, \frac{7}{8} \right\}$ $\left\{ \frac{3}{5}, \frac{3}{5} \right\}$	$\frac{7}{8} - \frac{3}{5} =$
5.	$\frac{4}{4} + \frac{5}{6}$	$\left\{ \frac{4}{4}, \frac{4}{4} \right\}$ $\left\{ \frac{5}{6}, \frac{5}{6} \right\}$	$\frac{4}{4} + \frac{5}{6} =$
6.	$\frac{4}{5} - \frac{3}{7}$	$\left\{ \frac{4}{5}, \frac{4}{5} \right\}$ $\left\{ \frac{3}{7}, \frac{3}{7} \right\}$	$\frac{4}{5} - \frac{3}{7} =$

1. A Is 10 a multiple of 8? _____

B Is 2×10 a multiple of 8? _____

C Is 3×10 a multiple of 8? _____

D Is 4×10 a multiple of 8? _____

E When you have found the **least common multiple** of 10 and 8 you have found the **least common denominator** for $\frac{3}{10}$ and $\frac{5}{8}$.

What is this number? _____

F In each problem below, give the **least common denominator** in each. Then give the missing numerators and find the sum or difference.

$$\frac{3}{10} = \frac{12}{\quad}$$

$$\frac{5}{8} = \frac{25}{\quad}$$

$$+ \frac{5}{8} = \frac{25}{\quad}$$

$$- \frac{3}{10} = \frac{12}{\quad}$$

2. In each problem, first give the least common denominator in each. Then give the correct numerators and find the sum or difference.

A $\frac{5}{6} = \frac{\quad}{\quad}$
 $+ \frac{3}{4} = \frac{\quad}{\quad}$

B $\frac{3}{5} = \frac{\quad}{\quad}$
 $+ \frac{2}{3} = \frac{\quad}{\quad}$

C $\frac{2}{10} = \frac{\quad}{\quad}$
 $+ \frac{6}{15} = \frac{\quad}{\quad}$

D $\frac{5}{8} = \frac{\quad}{\quad}$
 $+ \frac{1}{6} = \frac{\quad}{\quad}$

E $\frac{5}{6} = \frac{\quad}{\quad}$
 $- \frac{2}{9} = \frac{\quad}{\quad}$

F $\frac{7}{12} = \frac{\quad}{\quad}$
 $- \frac{1}{4} = \frac{\quad}{\quad}$

G $\frac{3}{10} = \frac{\quad}{\quad}$
 $- \frac{4}{15} = \frac{\quad}{\quad}$

H $\frac{4}{5} = \frac{\quad}{\quad}$
 $- \frac{1}{4} = \frac{\quad}{\quad}$

I $\frac{3}{7} + \frac{2}{3}$

$\frac{\quad}{\quad} + \frac{\quad}{\quad} = \frac{\quad}{\quad}$

J $\frac{1}{2} + \frac{2}{3}$

$\frac{\quad}{\quad} + \frac{\quad}{\quad} = \frac{\quad}{\quad}$

K $\frac{9}{11} + \frac{2}{5}$

$\frac{\quad}{\quad} + \frac{\quad}{\quad} = \frac{\quad}{\quad}$

1. Sleeping: $\frac{1}{3}$ of the day.
Eating: $\frac{1}{8}$ of the day.
What part of the day was
spent for sleeping

and eating? _____



2. Morning: gas tank $\frac{3}{4}$ full.
Evening: tank $\frac{3}{8}$ full.
What part of a tank of gas was
used during the day? _____

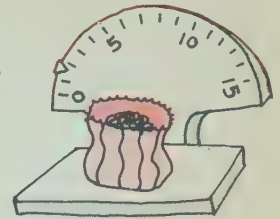
3. Tuesday: complete $\frac{4}{8}$ of the trip.
Wednesday: complete another $\frac{1}{6}$
of the trip. What part of the trip
is completed? _____

4. Delivered $\frac{3}{4}$ tonne of coal. Then
delivered $\frac{1}{5}$ tonne. Delivered
what part of a tonne of
coal in all? _____

5. Dancing lesson: $\frac{2}{3}$ hour.
Music lesson: $\frac{3}{4}$ hour.
How much longer was the
music lesson? _____

6. Peanuts: $\frac{5}{6}$ kilogram.
Cashews: $\frac{4}{9}$ kilogram.
How many kilograms

of nuts? _____



7. Paul: woke up $\frac{3}{4}$ hour before sunrise.
Jeff: woke up $\frac{7}{10}$ hour before sunrise.

Who woke up earlier? _____

How much earlier? _____

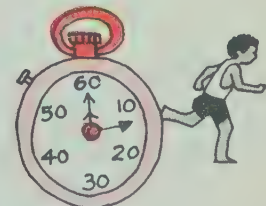
8. Recipe: $\frac{3}{4}$ litre of milk.
 $\frac{1}{5}$ litre of vegetable oil.
How much more milk than
vegetable oil? _____



9. Antifreeze: 1 litre. Spilled
about $\frac{3}{8}$ litre. About what part
of a litre was left? _____

10. Ran: $\frac{1}{6}$ hour.
Walked: $\frac{5}{8}$ hour.
Rested: the remainder of the hour.

Rested what part of the hour? _____



● Mixed Numerals and Improper Fractions

1. Give a whole number in each . Then give the mixed numeral in each .

A $\frac{12}{3} =$ 4 $\rightarrow \frac{13}{3} =$ $4\frac{1}{3}$

D $\frac{24}{6} =$ $\rightarrow \frac{28}{6} =$

B $\frac{8}{4} =$ $\rightarrow \frac{10}{4} =$

E $\frac{18}{3} =$ $\rightarrow \frac{20}{3} =$

C $\frac{15}{3} =$ $\rightarrow \frac{17}{3} =$

F $\frac{16}{2} =$ $\rightarrow \frac{17}{2} =$

2. Give the missing numerator in each . Then give the improper fraction in each .

A $3\frac{1}{4} = \frac{12}{4} + \frac{1}{4} =$ $\frac{13}{4}$

D $4\frac{1}{6} = \frac{ }{6} + \frac{1}{6} =$

B $6\frac{1}{3} = \frac{ }{3} + \frac{1}{3} =$

E $1\frac{5}{8} = \frac{ }{8} + \frac{5}{8} =$

C $3\frac{2}{5} = \frac{ }{5} + \frac{2}{5} =$

F $2\frac{3}{7} = \frac{ }{7} + \frac{3}{7} =$

3. Write a mixed numeral for each improper fraction.

A $\frac{5}{3}$

C $\frac{11}{10}$

E $\frac{16}{7}$

G $\frac{38}{7}$

B $\frac{7}{2}$

D $\frac{21}{4}$

F $\frac{25}{3}$

H $\frac{51}{4}$

4. Write an improper fraction for each mixed numeral.

A $1\frac{3}{4}$

C $2\frac{1}{5}$

E $9\frac{1}{3}$

G $4\frac{7}{8}$

B $1\frac{9}{10}$

D $6\frac{3}{5}$

F $3\frac{10}{11}$

H $5\frac{2}{3}$

5. Give the missing numerators.

A $5\frac{3}{4} = 5\frac{6}{8} = 4\frac{14}{8}$

C $8\frac{2}{5} = 8\frac{ }{15} = 7\frac{ }{15}$

B $7\frac{1}{3} = 7\frac{ }{9} = 6\frac{ }{9}$

D $7\frac{2}{3} = 7\frac{ }{6} = 6\frac{ }{6}$

6. Give the missing numerators. Then give the mixed numeral with a lowest-terms fraction.

A $4\frac{6}{4} = 5\frac{2}{4} =$ $5\frac{1}{2}$

C $1\frac{10}{6} = 2\frac{ }{6} =$

B $6\frac{12}{9} = 7\frac{ }{9} =$

D $3\frac{10}{8} = 4\frac{ }{8} =$

1. Because of the **commutative** and **associative** principles, you may choose any two addends to add first. Give the missing numbers.

Find the sum of these addends.

$$3\frac{5}{8} + 2\frac{1}{4} = (3 + \frac{5}{8}) + (2 + \frac{1}{4}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$$

Then find the sum of these addends.

2. Give the correct whole number in the black blank. Then give the correct fraction in the red blank. Finally, give the sum in the .

A $5\frac{1}{3} + 3\frac{1}{4} = (5 + \frac{1}{3}) + (3 + \frac{1}{4}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

B $2\frac{1}{2} + 6\frac{3}{8} = (2 + \frac{1}{2}) + (6 + \frac{3}{8}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

C $4\frac{3}{10} + 7\frac{2}{5} = (4 + \frac{3}{10}) + (7 + \frac{2}{5}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

3. Find the sums.

A
$$\begin{array}{r} 2\frac{1}{3} \\ + 9\frac{7}{9} \\ \hline \end{array}$$

B
$$\begin{array}{r} 3\frac{1}{6} \\ + 8\frac{3}{4} \\ \hline \end{array}$$

C
$$\begin{array}{r} 5\frac{5}{8} \\ + 9\frac{1}{6} \\ \hline \end{array}$$

D
$$\begin{array}{r} 3\frac{3}{4} \\ + 6\frac{2}{3} \\ \hline \end{array}$$

4. Find the differences.

A
$$\begin{array}{r} 12\frac{1}{2} \\ - 8\frac{1}{4} \\ \hline \end{array}$$

B
$$\begin{array}{r} 16\frac{3}{4} \\ - 9\frac{3}{8} \\ \hline \end{array}$$

C
$$\begin{array}{r} 21\frac{7}{8} \\ - 12\frac{2}{3} \\ \hline \end{array}$$

D
$$\begin{array}{r} 56\frac{9}{10} \\ - 32\frac{1}{4} \\ \hline \end{array}$$

5. Give the missing numerators. Then find the differences.

A
$$\begin{array}{r} 5\frac{1}{2} = 5\frac{2}{4} = 4\frac{6}{4} \\ - 3\frac{3}{4} = 3\frac{3}{4} = 3\frac{3}{4} \end{array}$$

B
$$\begin{array}{r} 12\frac{1}{8} = 12\frac{1}{8} = 11\frac{9}{8} \\ - 6\frac{3}{4} = 6\frac{6}{8} = 6\frac{6}{8} \end{array}$$

C
$$\begin{array}{r} 8\frac{1}{2} = 7\frac{9}{9} \\ - 2\frac{5}{9} = 2\frac{5}{9} \end{array}$$

6. Find the differences.

A
$$\begin{array}{r} 6\frac{1}{3} \\ - 2\frac{5}{6} \\ \hline \end{array}$$

B
$$\begin{array}{r} 37\frac{1}{2} \\ - 29\frac{9}{10} \\ \hline \end{array}$$

C
$$\begin{array}{r} 9\frac{1}{3} \\ - 3\frac{4}{7} \\ \hline \end{array}$$

D
$$\begin{array}{r} 128\frac{1}{5} \\ - 83\frac{1}{3} \\ \hline \end{array}$$

1. To find the least common denominator for three or more fractional numbers, find the least common multiple (LCM) of two of the denominators at a time.

$\begin{array}{r} \frac{5}{6} \\ \frac{3}{4} \\ + \frac{1}{8} \\ \hline \end{array}$	<p>List some multiples of 6: { <u>6, 12,</u> _____ } The LCM of</p> <p>List some multiples of 4: { _____ } 6 and 4 is _____.</p> <p>List some multiples of 8: { _____ }</p> <p>List some multiples of 12: { _____ }</p> <p>What is the LCM of 12 and 8? _____</p> <p>The least common denominator for $\frac{5}{6}$, $\frac{3}{4}$, and $\frac{1}{8}$ is _____.</p>
--	--

2. Find the sums. Give the sums in lowest terms.

A

$$\begin{array}{r} \frac{1}{2} \\ \frac{2}{7} \\ + \frac{3}{14} \\ \hline \end{array}$$

B

$$\begin{array}{r} \frac{3}{8} \\ \frac{1}{12} \\ + \frac{5}{6} \\ \hline \end{array}$$

C

$$\begin{array}{r} \frac{3}{10} \\ \frac{4}{5} \\ + \frac{1}{4} \\ \hline \end{array}$$

D

$$\begin{array}{r} \frac{7}{10} \\ \frac{3}{5} \\ + \frac{2}{15} \\ \hline \end{array}$$

E

$$\begin{array}{r} 3\frac{1}{8} \\ 8\frac{3}{4} \\ + 9\frac{5}{6} \\ \hline \end{array}$$

F

$$\begin{array}{r} 12\frac{1}{6} \\ 2\frac{2}{9} \\ + 10\frac{3}{4} \\ \hline \end{array}$$

G

$$\begin{array}{r} 52\frac{1}{8} \\ 48\frac{3}{16} \\ + 7\frac{1}{4} \\ \hline \end{array}$$

H

$$\begin{array}{r} 397\frac{1}{10} \\ 285\frac{3}{5} \\ + 600\frac{5}{8} \\ \hline \end{array}$$

3. Solve each story problem.

A Mrs. Komo purchased $1\frac{1}{4}$ m of lining, $3\frac{3}{8}$ m of dress fabric, and $1\frac{1}{2}$ m of trim. What was the total length?

B Scott weighs $32\frac{1}{8}$ kg. David weighs $27\frac{5}{16}$ kg. Sam weighs $30\frac{3}{4}$ kg. What is their total weight?

Find the quotient and remainder in part A. Use it to help you write the correct mixed numeral in part B.

1. A $4 \overline{) 97} \text{ r } 1$

B $\frac{97}{4} = 24\frac{1}{4}$

2. A $5 \overline{) 123} \text{ r } \underline{\hspace{1cm}}$

B $\frac{123}{5} = \underline{\hspace{1cm}}$

3. A $6 \overline{) 79} \text{ r } \underline{\hspace{1cm}}$

B $\frac{79}{6} = \underline{\hspace{1cm}}$

4. A $3 \overline{) 137} \text{ r } \underline{\hspace{1cm}}$

B $\frac{137}{3} = \underline{\hspace{1cm}}$

5. A $8 \overline{) 332} \text{ r } \underline{\hspace{1cm}}$

B $\frac{332}{8} = \underline{\hspace{1cm}}$

6. A $7 \overline{) 456} \text{ r } \underline{\hspace{1cm}}$

B $\frac{456}{7} = \underline{\hspace{1cm}}$

7. A $5 \overline{) 293} \text{ r } \underline{\hspace{1cm}}$

B $\frac{293}{5} = \underline{\hspace{1cm}}$

8. A $4 \overline{) 231} \text{ r } \underline{\hspace{1cm}}$

B $\frac{231}{4} = \underline{\hspace{1cm}}$

9. A $9 \overline{) 560} \text{ r } \underline{\hspace{1cm}}$

B $\frac{560}{9} = \underline{\hspace{1cm}}$

10. A $6 \overline{) 385} \text{ r } \underline{\hspace{1cm}}$

B $\frac{385}{6} = \underline{\hspace{1cm}}$

11. A $2 \overline{) 197} \text{ r } \underline{\hspace{1cm}}$

B $\frac{197}{2} = \underline{\hspace{1cm}}$

12. A $3 \overline{) 269} \text{ r } \underline{\hspace{1cm}}$

B $\frac{269}{3} = \underline{\hspace{1cm}}$

1. Find the sums and differences.

A $\frac{1}{8} + \frac{5}{8} = \underline{\hspace{2cm}}$

B $\frac{9}{10} - \frac{3}{10} = \underline{\hspace{2cm}}$

C $\frac{8}{15} - \frac{1}{5} = \underline{\hspace{2cm}}$

2. Write an improper fraction for each mixed numeral.

A $5\frac{1}{8} \underline{\hspace{2cm}}$

B $7\frac{1}{6} \underline{\hspace{2cm}}$

C $2\frac{7}{8} \underline{\hspace{2cm}}$

D $16\frac{2}{3} \underline{\hspace{2cm}}$

3. Write a mixed numeral for each improper fraction.

A $\frac{35}{3} \underline{\hspace{2cm}}$

B $\frac{30}{8} \underline{\hspace{2cm}}$

C $\frac{76}{6} \underline{\hspace{2cm}}$

D $\frac{219}{10} \underline{\hspace{2cm}}$

4. Find the sums.

A
$$\begin{array}{r} \frac{7}{10} \\ + \frac{3}{5} \\ \hline \end{array}$$

B
$$\begin{array}{r} 6\frac{1}{3} \\ + 3\frac{1}{8} \\ \hline \end{array}$$

C
$$\begin{array}{r} 28\frac{4}{5} \\ + 49\frac{3}{4} \\ \hline \end{array}$$

D
$$\begin{array}{r} 18\frac{3}{8} \\ + 36\frac{1}{5} \\ \hline \end{array}$$

5. Find the differences.

A
$$\begin{array}{r} \frac{5}{9} \\ - \frac{1}{6} \\ \hline \end{array}$$

B
$$\begin{array}{r} 5\frac{1}{4} \\ - 2\frac{4}{7} \\ \hline \end{array}$$

C
$$\begin{array}{r} 56\frac{5}{12} \\ - 38\frac{7}{8} \\ \hline \end{array}$$

D
$$\begin{array}{r} 100 \\ - 37\frac{5}{6} \\ \hline \end{array}$$

CHANGE OF PACE

Complete the **magic squares**. The row sums, column sums, and the sums from one corner to another should be the same.

1.

17		4	14
6	12		9
10	8	7	
5	15	16	

2.

39	25	26	36
	34	33	31
32	30		
	37	38	24

3.

65		52	62
	60	59	57
58		55	61
53		64	50

1.

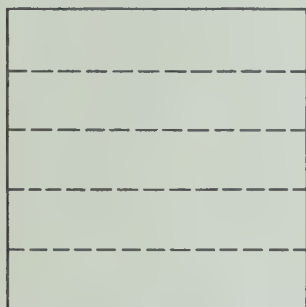


$$\frac{1}{2} \times \frac{1}{3} = \underline{\hspace{2cm}}$$

A Shade $\frac{1}{3}$ of the region red.B Shade $\frac{1}{2}$ of the red region gray.

C In the blank show what part of the complete region has been shaded both red and gray.

2.



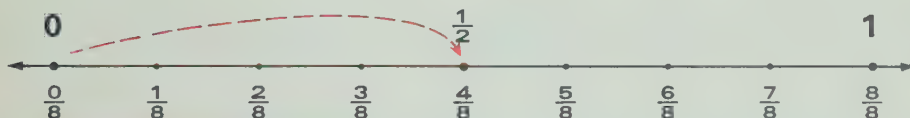
$$4 \times \frac{1}{5} = \underline{\hspace{2cm}}$$

A Shade $\frac{1}{5}$ of the region red.

B Do part A 4 times.

C In the blank show what part of the region is now shaded red.

3.



$$\frac{1}{4} \times \frac{1}{2} = \underline{\hspace{2cm}}$$

A Think of a jump to $\frac{1}{2}$.B Show a jump $\frac{1}{4}$ of the way to $\frac{1}{2}$.

C In the blank, give the number of the landing point for the jump in part B.

4.



$$5 \times \frac{1}{3} = \underline{\hspace{2cm}}$$

A Show 5 jumps of $\frac{1}{3}$.

B In the blank, give the number of the landing point.

5. Find the products.

A $\frac{1}{3} \times \frac{1}{5} = \underline{\hspace{2cm}}$

D $9 \times \frac{1}{5} = \underline{\hspace{2cm}}$

G $\frac{1}{100} \times \frac{1}{10} = \underline{\hspace{2cm}}$

B $4 \times \frac{1}{11} = \underline{\hspace{2cm}}$

E $\frac{1}{10} \times \frac{1}{12} = \underline{\hspace{2cm}}$

H $7 \times \frac{1}{10} = \underline{\hspace{2cm}}$

C $\frac{1}{3} \times \frac{1}{10} = \underline{\hspace{2cm}}$

F $12 \times \frac{1}{5} = \underline{\hspace{2cm}}$

I $\frac{1}{4} \times \frac{1}{5} = \underline{\hspace{2cm}}$

1. Use the **0** and **1** principles to find the products.

A $\frac{1}{6} \times 1 = \underline{\hspace{2cm}}$ C $1 \times \frac{3}{8} = \underline{\hspace{2cm}}$ E $\frac{7}{5} \times 1 = \underline{\hspace{2cm}}$ G $\frac{0}{5} \times \frac{2}{2} = \underline{\hspace{2cm}}$

B $\frac{1}{6} \times \frac{3}{3} = \underline{\hspace{2cm}}$ D $\frac{1}{5} \times 0 = \underline{\hspace{2cm}}$ F $\frac{1}{5} \times \frac{0}{3} = \underline{\hspace{2cm}}$ H $\frac{5}{6} \times \frac{4}{4} = \underline{\hspace{2cm}}$

2. Use the **commutative principle** to find the products.

A $5 \times \frac{1}{3} = \underline{\hspace{2cm}}$ $\rightarrow \frac{1}{3} \times 5 = \underline{\hspace{2cm}}$ C $9 \times \frac{1}{8} = \underline{\hspace{2cm}}$ $\rightarrow \frac{1}{8} \times 9 = \underline{\hspace{2cm}}$

B $3 \times \frac{1}{7} = \underline{\hspace{2cm}}$ $\rightarrow \frac{1}{7} \times 3 = \underline{\hspace{2cm}}$ D $12 \times \frac{1}{5} = \underline{\hspace{2cm}}$ $\rightarrow \frac{1}{5} \times 12 = \underline{\hspace{2cm}}$

3. Use the **associative principle** to give the missing numbers. Then find the products.

A $(5 \times \frac{1}{2}) \times \frac{1}{3} = 5 \times (\underline{\hspace{2cm}} \times \frac{1}{3}) = \square \times \square = \underline{\hspace{2cm}}$ C $(6 \times \frac{1}{4}) \times \frac{1}{3} = 6 \times (\frac{1}{4} \times \underline{\hspace{2cm}}) = \square \times \square = \underline{\hspace{2cm}}$

B $(8 \times \frac{1}{5}) \times \frac{1}{4} = \underline{\hspace{2cm}} \times (\frac{1}{5} \times \frac{1}{4}) = \square \times \square = \underline{\hspace{2cm}}$ D $(7 \times \frac{1}{6}) \times \frac{1}{5} = \underline{\hspace{2cm}} \times (\frac{1}{6} \times \frac{1}{5}) = \square \times \square = \underline{\hspace{2cm}}$

4. Using the **commutative** and **associative principles**, you can arrange the factors in any way that is convenient. Give a whole number for each \square . Give a fraction for each \square . Then find the product.

A $\frac{3}{5} \times \frac{4}{3} = (3 \times \frac{1}{5}) \times (4 \times \frac{1}{3}) = \square \times \square = \underline{\hspace{2cm}}$

Multiply these first.

B $\frac{2}{5} \times \frac{3}{8} = (2 \times \frac{1}{5}) \times (3 \times \frac{1}{8}) = \square \times \square = \underline{\hspace{2cm}}$

Then multiply these.

C $\frac{5}{8} \times \frac{5}{6} = (5 \times \frac{1}{8}) \times (5 \times \frac{1}{6}) = \square \times \square = \underline{\hspace{2cm}}$

5. Find the products.

A $\frac{3}{4} \times \frac{5}{6} = \underline{\hspace{2cm}}$ C $\frac{5}{16} \times \frac{2}{3} = \underline{\hspace{2cm}}$ E $\frac{5}{6} \times \frac{2}{3} = \underline{\hspace{2cm}}$ G $\frac{5}{8} \times \frac{3}{2} = \underline{\hspace{2cm}}$

B $\frac{3}{10} \times \frac{4}{5} = \underline{\hspace{2cm}}$ D $\frac{4}{7} \times \frac{5}{9} = \underline{\hspace{2cm}}$ F $\frac{2}{3} \times \frac{7}{10} = \underline{\hspace{2cm}}$ H $\frac{3}{7} \times \frac{2}{9} = \underline{\hspace{2cm}}$

1. Use the **distributive principle** to give the missing numbers and to find the products. Use mixed numerals with lowest-terms fractions for the final product.

A $5 \times 3\frac{1}{4} = (5 \times 3) + (5 \times \frac{1}{4}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

B $8 \times 3\frac{1}{4} = (8 \times \underline{\quad}) + (8 \times \underline{\quad}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

C $\frac{1}{2} \times 2\frac{1}{3} = (\underline{\quad} \times 2) + (\underline{\quad} \times \frac{1}{3}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

D $\frac{1}{3} \times 6\frac{3}{4} = (\frac{1}{3} \times \underline{\quad}) + (\frac{1}{3} \times \underline{\quad}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

E $1\frac{1}{2} \times 6 = (1 \times \underline{\quad}) + (\frac{1}{2} \times \underline{\quad}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

F $7 \times 3\frac{1}{5} = (7 \times \underline{\quad}) + (7 \times \underline{\quad}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

G $\frac{1}{6} \times 1\frac{1}{2} = (\frac{1}{6} \times \underline{\quad}) + (\frac{1}{6} \times \underline{\quad}) = \underline{\quad} + \underline{\quad} = \underline{\quad}$

2. Find the products by first replacing each mixed numeral with an improper fraction as in the example.

Write the correct improper fraction in each . Then write a mixed numeral for the final product in the .

A $1\frac{1}{3} \times 2\frac{1}{5} = 2\frac{14}{15}$
 $\downarrow \quad \downarrow \quad \uparrow$
43 \times 115 $=$ 4415

D $\frac{4}{5} \times 2\frac{2}{3} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

G $3\frac{1}{2} \times 5\frac{2}{5} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

B $2\frac{1}{2} \times 1\frac{3}{4} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

E $4 \times 3\frac{1}{4} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

H $8 \times 1\frac{5}{6} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

C $2\frac{1}{3} \times 1\frac{1}{2} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

F $1\frac{1}{4} \times 2\frac{1}{3} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

I $4\frac{1}{2} \times 5\frac{2}{3} =$
 $\downarrow \quad \downarrow \quad \uparrow$
 \times $=$

1. Find the products. Use an improper fraction in each and a whole number for each blank.

A $\frac{2}{7} \times \frac{7}{2} = \square = \underline{\hspace{2cm}}$

D $\frac{3}{1} \times \frac{1}{3} = \square = \underline{\hspace{2cm}}$

B $\frac{8}{3} \times \frac{3}{8} = \square = \underline{\hspace{2cm}}$

E $\frac{1}{9} \times 9 = \square = \underline{\hspace{2cm}}$

C $\frac{4}{5} \times \frac{5}{4} = \square = \underline{\hspace{2cm}}$

F $100 \times \frac{1}{100} = \square = \underline{\hspace{2cm}}$

If the product of two fractional numbers is 1, each number is the **reciprocal** of the other.

2. Give the reciprocal of each number.

A $\frac{3}{4}$ $\underline{\hspace{2cm}}$

D 5 $\underline{\hspace{2cm}}$

G $\frac{2}{3}$ $\underline{\hspace{2cm}}$

J $1\frac{1}{4}$ $\underline{\hspace{2cm}}$

B $\frac{1}{6}$ $\underline{\hspace{2cm}}$

E $\frac{7}{10}$ $\underline{\hspace{2cm}}$

H 2 $\underline{\hspace{2cm}}$

K 1 $\underline{\hspace{2cm}}$

C 54 $\underline{\hspace{2cm}}$

F $12\frac{1}{2}$ $\underline{\hspace{2cm}}$

I $2\frac{3}{4}$ $\underline{\hspace{2cm}}$

L $33\frac{1}{3}$ $\underline{\hspace{2cm}}$

3. Find the missing factors.

A $\frac{5}{8} \times \underline{\hspace{2cm}} = 1$

D $\frac{4}{5} \times \underline{\hspace{2cm}} = 1$

G $1\frac{1}{3} \times \underline{\hspace{2cm}} = 1$

B $\frac{1}{4} \times \underline{\hspace{2cm}} = 1$

E $\underline{\hspace{2cm}} \times 2 = 1$

H $8\frac{1}{2} \times \underline{\hspace{2cm}} = 1$

C $\underline{\hspace{2cm}} \times \frac{10}{3} = 1$

F $\frac{1}{16} \times \underline{\hspace{2cm}} = 1$

I $\underline{\hspace{2cm}} \times 1 = 1$

4. Give a whole number for each \square . Then find the product.

A $14 \times \frac{1}{2} = 7 \times (\square \times \frac{1}{2}) = \underline{\hspace{2cm}}$

E $48 \times \frac{1}{6} = 8 \times (\square \times \frac{1}{6}) = \underline{\hspace{2cm}}$

B $27 \times \frac{1}{3} = \square \times (3 \times \frac{1}{3}) = \underline{\hspace{2cm}}$

F $100 \times \frac{1}{20} = \square \times (20 \times \frac{1}{20}) = \underline{\hspace{2cm}}$

C $25 \times \frac{1}{5} = 5 \times (\square \times \frac{1}{5}) = \underline{\hspace{2cm}}$

G $54 \times \frac{1}{6} = \square \times (6 \times \frac{1}{6}) = \underline{\hspace{2cm}}$

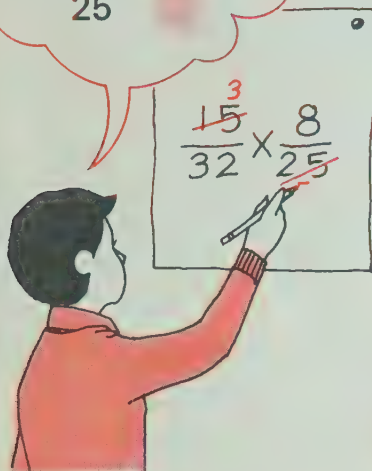
D $18 \times \frac{1}{9} = \square \times (9 \times \frac{1}{9}) = \underline{\hspace{2cm}}$

H $52 \times \frac{1}{4} = \square \times (4 \times \frac{1}{4}) = \underline{\hspace{2cm}}$

1. Give the numbers in each to show what the boy is thinking.
Study the way he does his work.

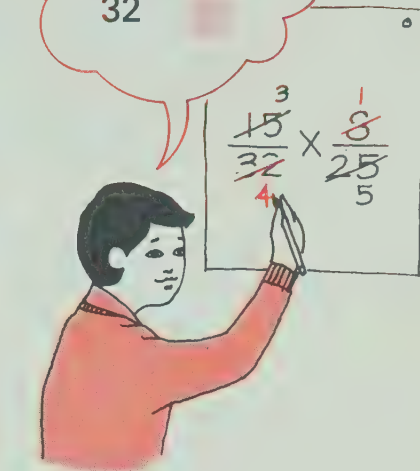
- A Both 15 and 25 can be divided by 5.

$$\frac{15}{25} = \frac{\quad}{\quad}$$



- B Both 8 and 32 can be divided by 8.

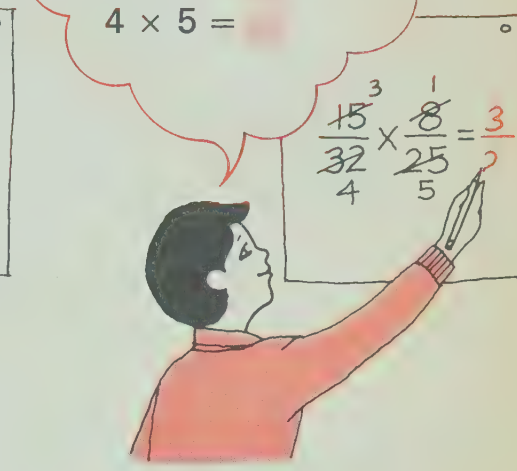
$$\frac{8}{32} = \frac{\quad}{\quad}$$



- C Multiply the numerators and denominators to find the product.

$$3 \times 1 = \quad$$

$$4 \times 5 = \quad$$



2. Use the short cut shown above to find the products.

A $\frac{7}{12} \times \frac{18}{1} = \underline{\quad}$

I $\frac{10}{20} \times \frac{30}{100} = \underline{\quad}$

Q $\frac{4}{5} \times \frac{30}{40} = \underline{\quad}$

B $\frac{5}{21} \times 18 = \underline{\quad}$

J $\frac{4}{7} \times \frac{21}{24} = \underline{\quad}$

R $\frac{9}{22} \times 11 = \underline{\quad}$

C $\frac{16}{35} \times \frac{25}{24} = \underline{\quad}$

K $\frac{3}{4} \times \frac{1}{3} = \underline{\quad}$

S $\frac{18}{25} \times \frac{5}{6} = \underline{\quad}$

D $\frac{7}{10} \times \frac{5}{21} = \underline{\quad}$

L $\frac{27}{49} \times \frac{7}{9} = \underline{\quad}$

T $\frac{24}{30} \times \frac{6}{10} = \underline{\quad}$

E $\frac{4}{9} \times \frac{6}{12} = \underline{\quad}$

M $\frac{14}{28} \times \frac{4}{7} = \underline{\quad}$

U $\frac{16}{35} \times \frac{7}{8} = \underline{\quad}$

F $\frac{12}{24} \times \frac{8}{12} = \underline{\quad}$

N $\frac{13}{15} \times \frac{30}{39} = \underline{\quad}$

V $\frac{9}{12} \times \frac{4}{9} = \underline{\quad}$

G $\frac{15}{20} \times \frac{6}{12} = \underline{\quad}$

O $\frac{25}{50} \times \frac{10}{100} = \underline{\quad}$

W $\frac{3}{7} \times 14 = \underline{\quad}$

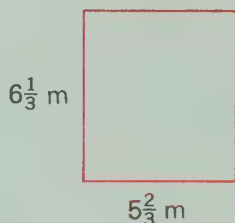
H $\frac{5}{12} \times \frac{9}{25} = \underline{\quad}$

P $\frac{8}{10} \times \frac{12}{16} = \underline{\quad}$

X $\frac{14}{20} \times \frac{10}{18} = \underline{\quad}$

1. Jane wanted to cut a ribbon into 5 pieces, each $3\frac{2}{5}$ cm long. How long a ribbon must she have to start with? _____

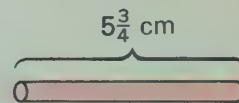
2. To find the area of a rectangle, you must multiply length times width. What is the area of this rectangle? _____



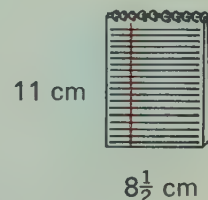
3. If flour costs $7\frac{1}{2}$ ¢ per kg, what would be the cost of $5\frac{3}{4}$ kg of flour? _____

4. A floor tile costs $11\frac{1}{4}$ ¢. What would 24 tiles cost? _____

5. If 5 of these rods → and $\frac{1}{2}$ of another one were glued together end to end, how long would the resulting rod be? _____



6. A piece of notebook paper is $8\frac{1}{2}$ cm wide and 11 cm long.



- A What is the area of the paper? _____
B What is the perimeter of the paper? _____

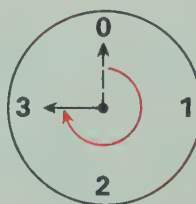
CHANGE OF PACE

A special one-handed clock can be used to find sums and products in a system of arithmetic called **modulo 4**.

1. The example will help you complete the addition table.
2. Use repeated addition to complete the multiplication table.
3. Use the tables to help you solve the equations.

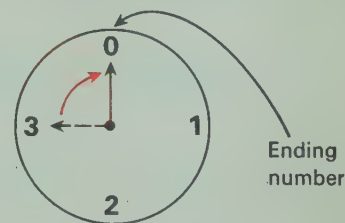
S A A P F F
A $0 - 3 = \square$ B $2 \div 3 = \square$

Move 3 spaces



3

Then move 1 space



3 + 1 = 0

+	0	1	2	3
0				
1				
2				
3				

×	0	1	2	3
0				
1				
2				
3				

1. Sometimes you can find the quotient of two fractional numbers by finding the missing factors.

P F F
 $\frac{8}{9} \div \frac{2}{3} = ?$



Think:

"What fractional number times $\frac{2}{3}$ gives $\frac{8}{9}$?

F F P
 $? \times \frac{2}{3} = \frac{8}{9}$

- A What is the missing factor? $\underline{\hspace{2cm}} \times \frac{2}{3} = \frac{8}{9}$
 B What is the quotient? $\frac{8}{9} \div \frac{2}{3} = \underline{\hspace{2cm}}$

2. Find the quotients.

$? \times \frac{3}{4} = \frac{15}{16}$

$? \times \frac{3}{2} = \frac{9}{10}$

$? \times \frac{1}{4} = \frac{3}{4}$

A $\frac{15}{16} \div \frac{3}{4} = \underline{\hspace{2cm}}$

B $\frac{9}{10} \div \frac{3}{2} = \underline{\hspace{2cm}}$

C $\frac{3}{4} \div \frac{1}{4} = \underline{\hspace{2cm}}$

D $\frac{2}{15} \div \frac{2}{3} = \underline{\hspace{2cm}}$

E $\frac{5}{4} \div \frac{1}{2} = \underline{\hspace{2cm}}$

F $\frac{7}{15} \div \frac{1}{3} = \underline{\hspace{2cm}}$

G $\frac{3}{4} \div \frac{1}{2} = \underline{\hspace{2cm}}$

H $\frac{10}{14} \div \frac{5}{7} = \underline{\hspace{2cm}}$

I $\frac{5}{6} \div \frac{1}{2} = \underline{\hspace{2cm}}$

J $\frac{10}{21} \div \frac{2}{7} = \underline{\hspace{2cm}}$

K $\frac{4}{5} \div 1 = \underline{\hspace{2cm}}$

L $\frac{0}{2} \div \frac{1}{2} = \underline{\hspace{2cm}}$

M $\frac{12}{25} \div \frac{4}{5} = \underline{\hspace{2cm}}$

N $\frac{10}{3} \div \frac{5}{3} = \underline{\hspace{2cm}}$

O $\frac{9}{9} \div \frac{1}{3} = \underline{\hspace{2cm}}$

P $\frac{100}{9} \div \frac{20}{3} = \underline{\hspace{2cm}}$

Q $\frac{5}{12} \div \frac{5}{4} = \underline{\hspace{2cm}}$

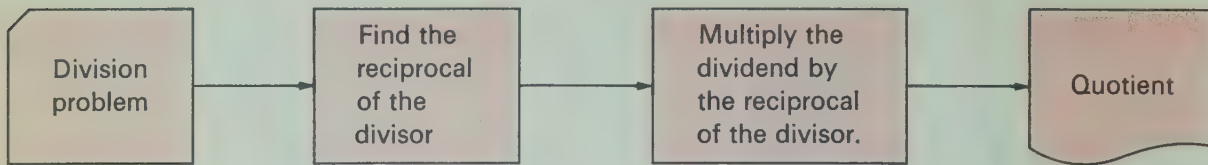
R $\frac{10}{10} \div \frac{5}{5} = \underline{\hspace{2cm}}$

S $\frac{27}{8} \div \frac{3}{4} = \underline{\hspace{2cm}}$

T $\frac{9}{16} \div \frac{3}{8} = \underline{\hspace{2cm}}$

U $\frac{24}{25} \div \frac{3}{5} = \underline{\hspace{2cm}}$

1. Give the missing fraction for each . Then find the products and quotients. Follow the steps in the flow chart to help you divide fractional numbers.



$$\frac{3}{7} \div \frac{5}{8}$$

The reciprocal of $\frac{5}{8}$ is $\frac{8}{5}$.

$$\frac{3}{7} \times \frac{8}{5} = \frac{24}{35}$$

$$\frac{3}{7} \div \frac{5}{8} = \frac{24}{35}$$

A $\frac{3}{5} \div \frac{2}{3}$

The reciprocal of $\frac{2}{3}$ is .

$$\frac{3}{5} \times \text{ } = \text{ }$$

$$\frac{3}{5} \div \frac{2}{3} = \text{ }$$

B $\frac{2}{7} \div \frac{4}{9}$

The reciprocal of $\frac{4}{9}$ is .

$$\frac{2}{7} \times \text{ } = \text{ }$$

$$\frac{2}{7} \div \frac{4}{9} = \text{ }$$

C $6 \div \frac{2}{5}$

The reciprocal of $\frac{2}{5}$ is .

$$6 \times \text{ } = \text{ }$$

$$6 \div \frac{2}{5} = \text{ }$$

2. Write each division problem as a multiplication problem. Then find the quotients.

A $\frac{6}{7} \div \frac{2}{3} = \frac{6}{7} \times \frac{3}{2} = \frac{12}{7}$

E $10 \div \frac{1}{2} = \text{ } \times \text{ } = \text{ }$

B $\frac{1}{2} \div \frac{1}{3} = \text{ } \times \text{ } = \text{ }$

F $\frac{3}{7} \div 3 = \text{ } \times \text{ } = \text{ }$

C $\frac{2}{5} \div \frac{1}{4} = \text{ } \times \text{ } = \text{ }$

G $\frac{3}{5} \div \frac{2}{3} = \text{ } \times \text{ } = \text{ }$

D $\frac{5}{9} \div \frac{1}{2} = \text{ } \times \text{ } = \text{ }$

H $\frac{5}{18} \div \frac{5}{18} = \text{ } \times \text{ } = \text{ }$

3. Find the quotients.

A $\frac{3}{4} \div \frac{5}{6} = \text{ }$

C $\frac{2}{3} \div 8 = \text{ }$

E $4 \div \frac{2}{3} = \text{ }$

B $\frac{1}{2} \div 6 = \text{ }$

D $\frac{6}{7} \div \frac{1}{2} = \text{ }$

F $\frac{9}{10} \div 5 = \text{ }$

1. Write the correct fraction in each . Then write a mixed numeral or lowest-terms fraction in the for the quotient.

A $2\frac{1}{4} \div 1\frac{1}{2}$

↓ ↓

$\frac{9}{4} \div \frac{3}{2} = \frac{9}{4} \times \frac{2}{3} = 1\frac{1}{2}$

B $\frac{5}{8} \div 1\frac{1}{3}$

↓ ↓

$\frac{}{} \div \frac{}{} = \frac{}{} \times \frac{}{} = \frac{}{}$

C $1\frac{1}{4} \div \frac{1}{5}$

↓ ↓

$\frac{}{} \div \frac{}{} = \frac{}{} \times \frac{}{} = \frac{}{}$

D $4\frac{1}{2} \div \frac{2}{3}$

↓ ↓

$\frac{}{} \div \frac{}{} = \frac{}{} \times \frac{}{} = \frac{}{}$

2. Simplify each expression as in the example.

Example: $\frac{\frac{1}{4}}{\frac{2}{3}} = \frac{1}{4} \div \frac{2}{3} = \frac{1}{4} \times \frac{3}{2} = \frac{3}{8}$

B $\frac{\frac{5}{6}}{\frac{1}{4}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

A $\frac{\frac{3}{5}}{\frac{1}{2}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

C $\frac{\frac{7}{10}}{\frac{1}{3}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

3. Find the quotients. Use mixed numerals in your answers.

A $4 \overline{) 9\frac{1}{4} 37}$

B $7 \overline{) 68}$

C $6 \overline{) 50}$

D $12 \overline{) 494}$

4. Find the quotients.

A $6\frac{1}{3} \div 2\frac{1}{2} = \underline{\hspace{2cm}}$

B $17\frac{1}{2} \div 3\frac{3}{4} = \underline{\hspace{2cm}}$

C $\frac{\frac{9}{10}}{\frac{5}{8}} = \underline{\hspace{2cm}}$

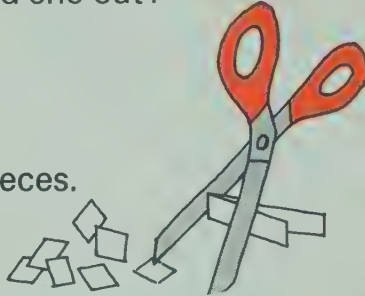
D $8 \overline{) 235} = \underline{\hspace{2cm}}$

For each exercise, write a division equation. Then solve it to complete the sentence.

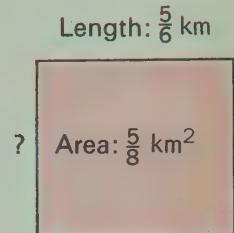
1. Joan had 8 cm of ribbon. She cut it into pieces each $\frac{2}{3}$ of a cm long. How many pieces did she cut?

$$8 \div \frac{2}{3} = n$$

There were 12 pieces.

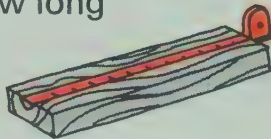


5. A field has area $\frac{5}{8} \text{ km}^2$ and length $\frac{5}{6} \text{ km}$. What is the width of the field?



The field is _____ km wide.

2. A carpenter had a board $5\frac{1}{2} \text{ m}$ long. He cut it into 3 pieces, each the same length. How long was each piece?



Each piece was _____ metres long.

6. A book is $1\frac{1}{4} \text{ cm}$ thick. How many of these books can be placed on a bookshelf 10 cm wide?



_____ books can be placed on the shelf.

3. If a barber can complete a haircut in $\frac{1}{4}$ hour, how many haircuts can he complete in $4\frac{1}{2}$ hours?

He can complete _____ haircuts.

7. 96 litres of oil are pumped into a tank at the rate of 7 litres per second. How many seconds does it take to pump all the oil into the tank?

It takes _____ seconds to pump the oil.

4. 56 kg of beans were put into 9 sacks. Each sack of beans weighed the same. What did each sack weigh?



Each sack weighed _____ kg.

8. David walks 2 kilometres each hour. How long will it take him to walk $5\frac{1}{3}$ kilometres?

At this rate, it would take David exactly _____ hours.

Ring the best estimate for each problem. Do as little calculating as possible.

1. One full box weighs $99\frac{3}{4}$ kg.
Another weighs $50\frac{1}{5}$ kg.
What is the total weight of both boxes together?

A 149 kg B 151 kg
C 150 kg

5. A can contains $16\frac{3}{4}$ g of fish and costs 48¢. How much does the fish cost per gram?

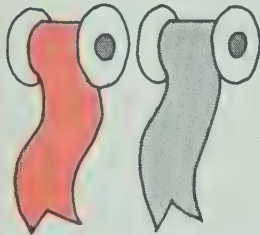
A 3¢ B 4¢ C 5¢

6. A container of water weighs 60 litre. If a litre of water weighs 1 kilogram how many kilograms of water are in $4\frac{1}{2}$ containers?

A 250 ℓ B 50 ℓ C 270 ℓ

2. The red ribbon was $34\frac{3}{20}$ cm long.
The blue ribbon was $21\frac{9}{10}$ cm long.
How much longer was the red ribbon?

A 10 cm
B 12 cm
C 13 cm

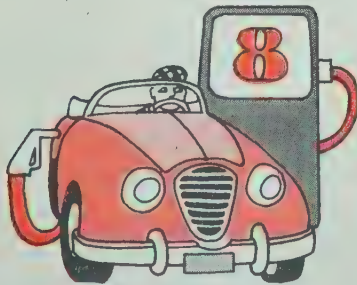


7. A garden is $29\frac{2}{5}$ m wide and $80\frac{1}{4}$ m long. What is the area of the garden?

A 2000 m² B 2800 m²
C 2400 m²

3. One litre of gasoline costs $16\frac{9}{10}$ ¢.
What is the cost of 10 litres?

A \$1.60 B \$1.70 C \$17.00



8. A paper clip is about $2\frac{1}{2}$ centimetres long.
How many centimetres long is a string of 15 paper clips?

A 32 cm B 38 cm C 30 cm



4. A man drove 200 km in $4\frac{1}{4}$ hours.
What was his average speed in kilometres per hour?

A 50 B 40 C 60

9. It takes about $2\frac{3}{4}$ hours to drive from town A to town B and back. Mr. Jones makes the drive 6 times a week. How many hours does he spend driving?

A 18 hours B 35 hours
C 20 hours

1. Find the products.

A $\frac{1}{3} \times \frac{1}{4} = \underline{\hspace{2cm}}$ B $\frac{1}{2} \times \frac{5}{6} = \underline{\hspace{2cm}}$ C $5 \times \frac{1}{2} = \underline{\hspace{2cm}}$ D $4 \times \frac{3}{8} = \underline{\hspace{2cm}}$
 E $\frac{4}{5} \times \frac{1}{4} = \underline{\hspace{2cm}}$ F $\frac{2}{3} \times \frac{9}{10} = \underline{\hspace{2cm}}$ G $\frac{5}{8} \times 1\frac{1}{3} = \underline{\hspace{2cm}}$ H $1\frac{2}{5} \times 8\frac{3}{4} = \underline{\hspace{2cm}}$

2. Find the quotients.

A $\frac{2}{5} \div \frac{3}{4} = \underline{\hspace{2cm}}$ B $\frac{8}{9} \div 2 = \underline{\hspace{2cm}}$ C $39 \div 7 = \underline{\hspace{2cm}}$ D $1\frac{7}{8} \div 1\frac{1}{2} = \underline{\hspace{2cm}}$

3. Ring the best estimate.

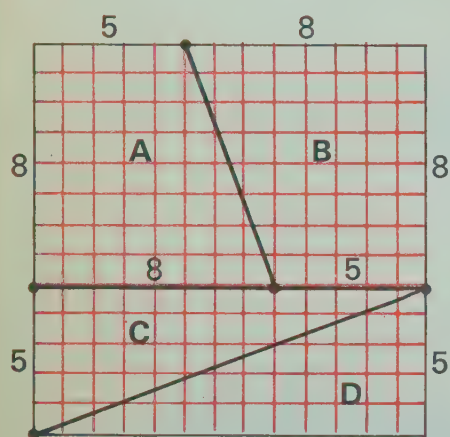
A $1\frac{1}{3}$ m of corduroy to make a skirt. Costs 99¢ a metre.

How much did the corduroy cost? \$1.20, \$1.35, \$1.50

B 50 walnuts in a box. How many walnuts in $6\frac{1}{4}$ boxes? 400, 300, 200

4. Find the exact answers for exercise 3. 3A: 3B:

CHANGE OF PACE



1. A Each side of the square is 8 units long.

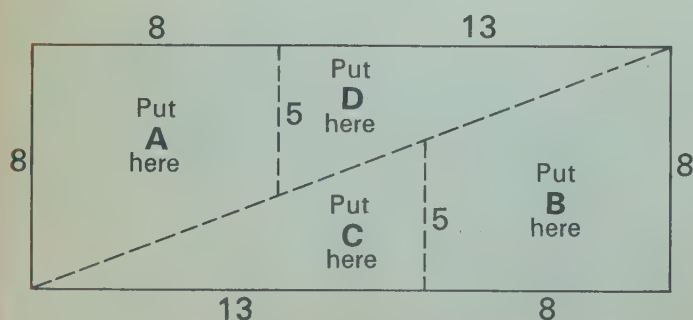
B The area of the square is 64 square units.

2. A It appears that pieces A, B, C, and D from the square will fit together to form the rectangle below with length 13 units and width 8 units.

B The area of the rectangle is 104 square units.

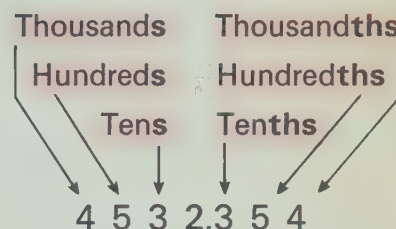
3. Can you explain why the area of the square is different from the area of the rectangle?

On a separate sheet of paper, trace a copy of the pieces of the square. Then cut out the pieces and paste them very carefully on the positions shown on the rectangle. Now can you explain?



1. Certain fractional numbers can be represented using **decimals**.
Give the missing numbers.

- A The 3 in the tens place means $3 \times \underline{10}$.
- B The 3 in the tenths place means $3 \times \underline{\frac{1}{10}}$.
- C The 5 in the hundreds place means $5 \times \underline{\hspace{1cm}}$.
- D The 5 in the hundredths place means $5 \times \underline{\hspace{1cm}}$.
- E The 4 in the thousands place means $4 \times \underline{\hspace{1cm}}$.
- F The 4 in the thousandths place means $4 \times \underline{\hspace{1cm}}$.



2. Give the missing words and numbers.

- A 8.04: The 4 in the hundredths place means $\underline{\frac{4}{100}}$.
- B 19.6: The 6 in the place means .
- C 2.018: The 8 in the place means .
- D 56.234: The 3 in the place means .
- E 78.254: The 4 in the place means .

3. Write each decimal as shown in the examples.

A $36.42 = \underline{36} + \underline{\frac{4}{10}} + \underline{\frac{2}{100}}$

D $0.923 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$

B $8.07 = \underline{8} + \underline{\frac{0}{10}} + \underline{\frac{7}{100}}$

E $4.23 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$

C $54.309 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$

F $61.3 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$

4. Write the correct decimal for each sum.

A $25 + \frac{9}{10} = \underline{\hspace{1cm}}$

D $49 + \frac{1}{10} + \frac{7}{100} + \frac{5}{1000} = \underline{\hspace{1cm}}$

B $7 + \frac{3}{10} + \frac{4}{100} = \underline{\hspace{1cm}}$

E $11 + \frac{7}{10} + \frac{9}{1000} = \underline{\hspace{1cm}}$

C $9 + \frac{2}{10} + \frac{5}{100} + \frac{1}{1000} = \underline{\hspace{1cm}}$

F $\frac{6}{10} + \frac{3}{100} + \frac{8}{1000} = \underline{\hspace{1cm}}$

1. Write the correct numeral in each .

Then write the correct mixed numeral in the blank.

A $3.54 = 3 + \frac{5}{10} + \frac{4}{100} = 3 + \frac{50}{100} + \frac{4}{100} =$

B $7.92 = 7 + \frac{}{10} + \frac{}{100} = 7 + \frac{}{100} + \frac{}{100} =$

C $6.375 = 6 + \frac{}{10} + \frac{}{100} + \frac{}{1000} = 6 + \frac{}{1000} + \frac{}{1000} + \frac{}{1000} =$

D $9.464 = 9 + \frac{}{10} + \frac{}{100} + \frac{}{1000} = 9 + \frac{}{1000} + \frac{}{1000} + \frac{}{1000} =$

E $5.806 = 5 + \frac{}{10} + \frac{}{100} + \frac{}{1000} = 5 + \frac{}{1000} + \frac{}{1000} + \frac{}{1000} =$

F $8.230 = 8 + \frac{}{10} + \frac{}{100} + \frac{}{1000} = 8 + \frac{}{1000} + \frac{}{1000} + \frac{}{1000} =$

2. Write the correct numeral in each . Then write the correct decimal in the blank.

A $6\frac{34}{100} = 6 + \frac{30}{100} + \frac{4}{100} = 6 + \frac{}{10} + \frac{4}{100} =$

B $3\frac{28}{100} = 3 + \frac{}{100} + \frac{8}{100} = 3 + \frac{}{10} + \frac{8}{100} =$

C $\frac{431}{100} = \frac{400}{100} + \frac{}{100} + \frac{1}{100} = \frac{}{10} + \frac{1}{100} =$

D $9\frac{506}{1000} = 9 + \frac{}{1000} + \frac{}{1000} + \frac{6}{1000} = 9 + \frac{}{10} + \frac{}{100} + \frac{6}{1000} =$

E $4\frac{712}{1000} = 4 + \frac{}{1000} + \frac{}{1000} + \frac{2}{1000} = 4 + \frac{}{10} + \frac{}{100} + \frac{2}{1000} =$

F $\frac{6873}{1000} = \frac{6000}{1000} + \frac{}{1000} + \frac{70}{1000} + \frac{3}{1000} = \frac{}{10} + \frac{}{100} + \frac{3}{1000} =$

3. Write the correct decimal or mixed numeral.

A $7.3 =$ $7\frac{3}{10}$

E $9.402 =$

I $= 6\frac{4}{1000}$

B $8\frac{2}{10} =$ 8.2

F $3\frac{225}{1000} =$

J $2.036 =$

C $6.25 =$

G $= 53\frac{27}{100}$


K $3\frac{27}{1000} =$


D $4\frac{36}{100} =$

H $= 8.05$

L $= 5.002$

1. Give the missing words **tenths**, **hundredths**, **thousandths**, **less**, or **greater**.
Give the correct sign ($<$ or $>$) in each .

A 5.632 and 5.732 differ in the number of _____.
5.632 is _____ than 5.732. We write 5.632  5.732.

B 3.854 and 3.834 differ in the number of _____.
3.854 is _____ than 3.834. We write 3.854  3.834.

2. Give the correct sign ($<$ or $>$) for each .

A 0.1  1	G 0.01  0.009	M 36.09  37.01
B 0.1  0.01	H 0.1  0.009	N 53.029  53.092
C 0.01  0.001	I 1.001  0.999	O 0.609  0.690
D 0.001  0.1	J 3.099  3.1	P 0.769  0.696
E 0.1  0.09	K 3.999  4	Q 4.051  4.053
F 0.3  0.08	L 54.9  55.1	R 0.045  0.046

3. Give the number that is **one tenth** less than:


A 0.9 _____ B 1.1 _____ C 1 _____ D 4.93 _____










4. Give the number that is **one hundredth** less than:

A 0.09 _____ B 1.01 _____ C 1 _____ D 3.5 _____

5. Give the number that is **one thousandth** less than:

A 0.369 _____ B 5.001 _____ C 5 _____ D 4.5 _____

6. Give the correct sign ($<$, $=$, or $>$) for each .

A 63.07  $63 + \frac{7}{10}$	D 5.039  $5 + \frac{3}{10} + \frac{9}{1000}$	G 1.2  $\frac{2}{10} + \frac{1}{100}$
B 7.56  $7 + \frac{5}{10} + \frac{6}{100}$	E 8.027  $8 + \frac{7}{100} + \frac{2}{10}$	H 0.769  $\frac{7}{1000} + \frac{6}{100} + \frac{9}{10}$
C 0.609  $\frac{6}{10} + \frac{9}{100}$	F 0.990  $\frac{9}{10} + \frac{9}{100} + \frac{9}{1000}$	I 0.303  $\frac{3}{1000} + \frac{0}{100} + \frac{3}{10}$

● Adding and Subtracting Decimals

1. Adding and subtracting **tenths**, **hundredths**, and **thousandths** is very much like adding and subtracting **tens**, **hundreds**, and **thousands**. Find the sums and differences.

$$\begin{array}{r} \text{A} \quad 0.39 \\ + 0.15 \\ \hline \end{array}$$

$$\begin{array}{r} \text{B} \quad 3.07 \\ + 4.26 \\ \hline \end{array}$$

$$\begin{array}{r} \text{C} \quad 4.98 \\ + 7.2 \\ \hline \end{array}$$

$$\begin{array}{r} \text{D} \quad 54.20 \\ + 16.99 \\ \hline \end{array}$$

$$\begin{array}{r} \text{E} \quad 0.046 \\ + 0.238 \\ \hline \end{array}$$

$$\begin{array}{r} \text{F} \quad 39.2 \\ + 14.83 \\ \hline \end{array}$$

$$\begin{array}{r} \text{G} \quad 0.73 \\ - 0.48 \\ \hline \end{array}$$

$$\begin{array}{r} \text{H} \quad 0.926 \\ - 0.189 \\ \hline \end{array}$$

$$\begin{array}{r} \text{I} \quad 6.05 \\ - 2.47 \\ \hline \end{array}$$

$$\begin{array}{r} \text{J} \quad 85.4 \\ - 9.23 \\ \hline \end{array}$$

$$\begin{array}{r} \text{K} \quad 350.3 \\ - 113.9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{L} \quad 824.16 \\ - 92.38 \\ \hline \end{array}$$

$$\begin{array}{r} \text{M} \quad 700.5 \\ + 296.5 \\ \hline \end{array}$$

$$\begin{array}{r} \text{N} \quad 96.28 \\ + 63.37 \\ \hline \end{array}$$

$$\begin{array}{r} \text{O} \quad 96.28 \\ - 63.37 \\ \hline \end{array}$$

$$\begin{array}{r} \text{P} \quad 54.20 \\ - 16.99 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Q} \quad 99.95 \\ + 32.06 \\ \hline \end{array}$$

$$\begin{array}{r} \text{R} \quad 4.256 \\ - 3.89 \\ \hline \end{array}$$

$$\begin{array}{r} \text{S} \quad 60.5 \\ + 29.3 \\ \hline \end{array}$$

$$\begin{array}{r} \text{T} \quad 3.42 \\ + 25.1 \\ \hline \end{array}$$

2. Write these problems vertically in the space provided below and find the sums.

$$\text{A} \quad 8.6 + 3.46 + 59.4 + 0.365$$

$$\text{D} \quad 0.039 + 0.549 + 0.207$$

$$\text{B} \quad 5.49 + 2.3 + 0.067 + 0.189$$

$$\text{E} \quad 28.9 + 63.27 + 19.358$$

$$\text{C} \quad 23.18 + 49.8 + 16.3 + 2.14$$

$$\text{F} \quad 4.06 + 9.97 + 12.459$$

A B C D E F

3. Solve each story problem.

- A Mr. Holten bought the following amounts of gasoline during one week:

Monday	9.6 litres
Tuesday	12.4 litres
Wednesday	7.8 litres
Thursday	13.6 litres

How many litres did he buy in all? _____

- B Mr. Donner recorded these odometer readings each day of his trip:

Monday	5325.6
Tuesday	5719.8
Wednesday	6358.7
Thursday	7198.8

What was the greatest distance he travelled between readings? _____

1. Ring the correct fraction and decimal for each part.

A $\frac{53}{100}$ is nearer to: $\frac{50}{100}$, $\frac{60}{100}$

0.53 rounded to the nearest **tenth** is: 0.5, 0.6

B $\frac{236}{1000}$ is nearer to: $\frac{230}{1000}$, $\frac{240}{1000}$

0.236 rounded to the nearest **hundredth** is: 0.23, 0.24

C $\frac{4637}{10000}$ is nearer to: $\frac{4000}{10000}$, $\frac{5000}{10000}$

0.4637 rounded to the nearest **tenth** is: 0.4, 0.5

D $\frac{55683}{100000}$ is nearer to: $\frac{55600}{100000}$, $\frac{55700}{100000}$

0.55683 rounded to the nearest **thousandth** is: 0.556, 0.557

E $\frac{47652}{100000}$ is nearer to: $\frac{47000}{100000}$, $\frac{48000}{100000}$

0.47652 rounded to the nearest **hundredth** is: 0.47, 0.48

F $\frac{846391}{1000000}$ is nearer to: $\frac{800000}{1000000}$, $\frac{900000}{1000000}$

0.846391 rounded to the nearest **tenth** is: 0.8, 0.9

2. Ring the correct decimal.

A 0.236 is nearer to: 0.23, 0.24

B 0.2364 is nearer to: 0.236, 0.237

c 0.2364 rounded to the nearest hundredth is: 0.23, 0.24

3. Round each number to the nearest **tenth**.

A 0.67 _____

B 8.357 _____

c 0.4638 _____

D 2.53694 _____

4. Round each number to the nearest **hundredth**.

A 0.496 _____

c 0.8765496 _____

E 0.8356 _____

B 0.537642 _____

D 5.635 _____

F 3.809 _____

5. Round each number to the nearest **thousandth**.

A 5.4696 _____

B 0.843596 _____

c 7.6834975 _____

1. Find the product of the numbers in the cloud. Then give the product of the same numbers, using decimals, in the .

<p>A $10 \times \frac{1}{10} =$ </p> <p>$10 \times .1 =$ </p>	<p>B $10 \times \frac{1}{100} =$ </p> <p>$10 \times .01 =$ </p>	<p>C $100 \times \frac{1}{10} =$ </p> <p>$100 \times .1 =$ </p>
<p>D $100 \times \frac{1}{100} =$ </p> <p>$100 \times .01 =$ </p>	<p>E $\frac{4}{10} \times \frac{6}{10} =$ </p> <p>$.4 \times .6 =$ </p>	<p>F $\frac{9}{10} \times \frac{46}{100} =$ </p> <p>$.9 \times .46 =$ </p>

2. Find the products.

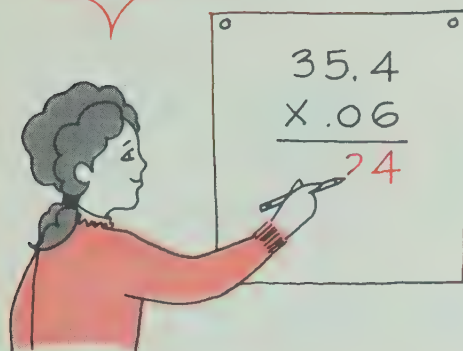
<p>A $10 \times 3 =$ </p> <p>$10 \times .9 =$ </p>	<p>→</p>	<p>$10 \times 3.9 =$ </p>
<p>B $10 \times 4 =$ </p> <p>$10 \times .05 =$ </p>	<p>→</p>	<p>$10 \times 4.05 =$ </p>
<p>C $100 \times 5 =$ </p> <p>$100 \times .1 =$ </p>	<p>→</p>	<p>$100 \times 5.1 =$ </p>
<p>D $100 \times .8 =$ </p> <p>$100 \times .03 =$ </p>	<p>→</p>	<p>$100 \times .83 =$ </p>

3. Find the products.

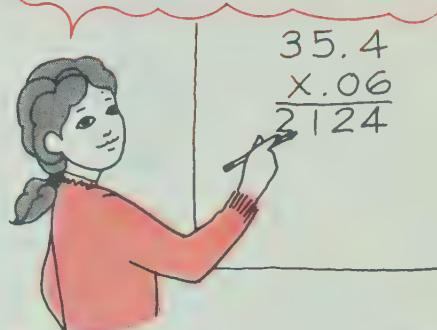
<p>A $10 \times .7 =$ </p>	<p>B $100 \times .18 =$ </p>	<p>C $10 \times 9.8 =$ </p>
<p>D $10 \times .14 =$ </p>	<p>E $10 \times 35.02 =$ </p>	<p>F $100 \times .07 =$ </p>
<p>G $10 \times .563 =$ </p>	<p>H $100 \times .465 =$ </p>	<p>I $100 \times 54.48 =$ </p>
<p>J $100 \times .002 =$ </p>	<p>K $10 \times 61.3 =$ </p>	<p>L $10 \times 3.09 =$ </p>
<p>M $10 \times .1096 =$ </p>	<p>N $100 \times 146.8 =$ </p>	<p>O $100 \times .078 =$ </p>

1. Complete the work in each cloud to show what the girl is thinking.
Study the pictures to see how she does her work.

$$\begin{array}{r} 354 \\ \times 6 \\ \hline \end{array}$$



$$\begin{array}{r} 35.4 \leftarrow \text{tenths (1-place decimal)} \\ \times 0.06 \leftarrow \text{hundredths (2-place decimal)} \\ \hline 2124 \leftarrow \text{()-place decimal} \end{array}$$



2. Find the products. Use a fraction for each $\frac{\quad}{\quad}$ and a decimal for each \quad .

A $100 \times \frac{1}{100} = \frac{\quad}{\quad}$
 $100 \times 0.01 = \quad$

B $\frac{1}{10} \times \frac{1}{10} = \frac{\quad}{\quad}$
 $0.1 \times 0.1 = \quad$

C $\frac{1}{10} \times \frac{1}{100} = \frac{\quad}{\quad}$
 $0.1 \times 0.01 = \quad$

3. Find the products.

$$\begin{array}{r} 23.6 \\ \times 0.4 \\ \hline \end{array}$$

B $\begin{array}{r} 4.57 \\ \times 0.02 \\ \hline \end{array}$

C $\begin{array}{r} 16.9 \\ \times 0.3 \\ \hline \end{array}$

D $\begin{array}{r} 49.8 \\ \times 0.7 \\ \hline \end{array}$

E $\begin{array}{r} 6.007 \\ \times 0.4 \\ \hline \end{array}$

F $\begin{array}{r} 8.003 \\ \times 9 \\ \hline \end{array}$

G $\begin{array}{r} 25.4 \\ \times 0.6 \\ \hline \end{array}$

H $\begin{array}{r} 12.5 \\ \times 0.03 \\ \hline \end{array}$

I $\begin{array}{r} 27.2 \\ \times 0.005 \\ \hline \end{array}$

J $\begin{array}{r} 38.5 \\ \times 0.4 \\ \hline \end{array}$

K $\begin{array}{r} 66.7 \\ \times 0.18 \\ \hline \end{array}$

L $\begin{array}{r} 5.95 \\ \times 0.24 \\ \hline \end{array}$

M $\begin{array}{r} 200.6 \\ \times 0.39 \\ \hline \end{array}$

N $\begin{array}{r} 7.76 \\ \times 0.25 \\ \hline \end{array}$

O $\begin{array}{r} 19.65 \\ \times 0.62 \\ \hline \end{array}$

P $\begin{array}{r} 947 \\ \times 0.64 \\ \hline \end{array}$

Q $\begin{array}{r} 94.7 \\ \times 0.64 \\ \hline \end{array}$

R $\begin{array}{r} 9.47 \\ \times 0.64 \\ \hline \end{array}$

S $\begin{array}{r} 865.7 \\ \times 0.23 \\ \hline \end{array}$

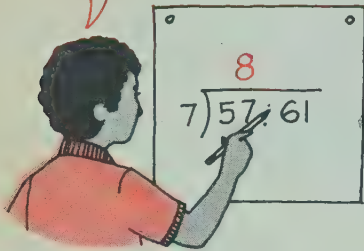
T $\begin{array}{r} 965.4 \\ \times 0.098 \\ \hline \end{array}$

● Dividing a Decimal by a Whole Number

1. Complete the work in each cloud to show what the boy is thinking.
Study the pictures to see how he does his work.

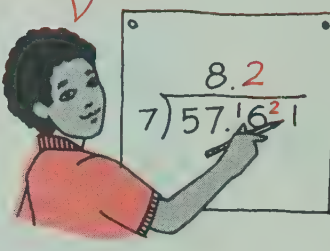
Dividing **ones**

$$7 \overline{) 57} \text{ r } \quad$$



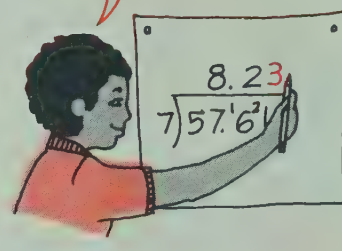
Dividing **tenths**

$$7 \overline{) 16} \text{ r } \quad$$



Dividing **hundredths**

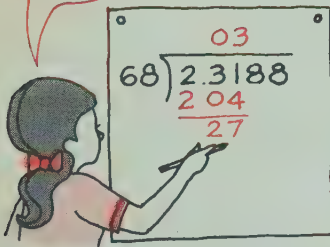
$$7 \overline{) 21} \text{ r } \quad$$



2. Complete the work in the cloud to show what the girl is thinking.
Study the pictures to see how she shows her work.

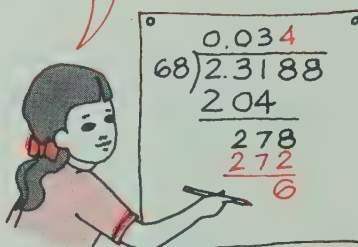
Dividing **hundredths**

$$68 \overline{) 231} \quad$$



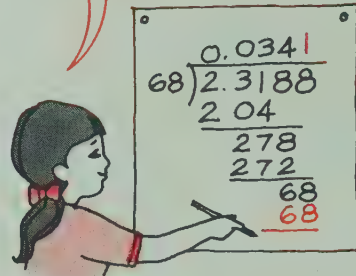
Dividing **thousandths**

$$68 \overline{) 278} \quad$$



Dividing **ten thousandths**

$$68 \overline{) 68} \quad$$



3. Find the quotients and check your work.

A $6 \overline{) 43.26}$ Check

B $3 \overline{) 29.43}$ Check

C $9 \overline{) 5.751}$ Check

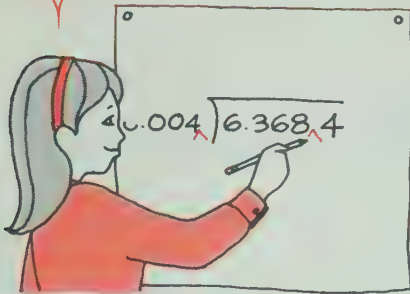
D $21 \overline{) 430.5}$ Check

E $57 \overline{) 0.6327}$ Check

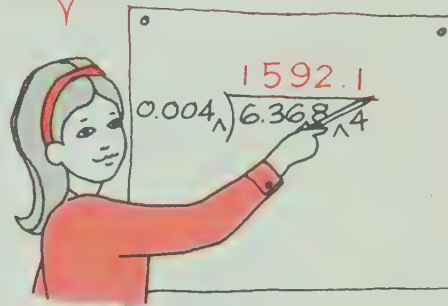
F $84 \overline{) 7.896}$ Check

1. When the divisor is a decimal, it is easier to find the quotient if we find a **division problem with a whole-number divisor that has the same answer**. Complete the work in the cloud to show what the girl is thinking. Then study the pictures to see how she shows her work.

Multiply divisor and dividend by 1000.
 $1000 \times 0.004 =$ 10000
 $1000 \times 6.3684 =$ 6368.4



1592.1
 $4 \overline{) 6368.4}$



2. Find the quotients. Check your work.

A $0.8 \overline{) 34.56}$

Check

B $0.06 \overline{) 5.538}$

Check

C $9.2 \overline{) 74.52}$

Check

D $0.003 \overline{) 0.8262}$

Check

E $2.7 \overline{) 1.350}$

Check

F $5.8 \overline{) 15.66}$

Check

G $0.45 \overline{) 1.845}$

Check

H $0.007 \overline{) 0.3437}$

Check

I $0.19 \overline{) 13.908}$

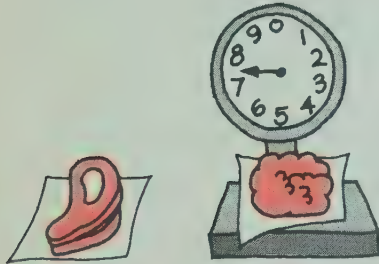
Check

Write the correct answer in the blank.

1. A litre of milk weighs about 1.2 kg. A tank contains 81.6 kg of milk. How many litres of milk does it contain? _____



2. A housewife bought 7.5 kg of meat. The total cost was \$17.25. How much did the meat cost per kg? _____



3. A paper clip is 2.54 centimetres long. How many paper clips long is a chain that is 12.7 centimetres long? _____
4. Nitrogen makes up 0.78 of each cubic metre of air. Oxygen makes up 0.21 of each cubic metre of air. A room is 12 m long, 9 m wide, and 7 m high.
- A How many cubic metres of air does the room contain? _____
 - B How many cubic metres of nitrogen does the room contain? _____
 - C How many cubic metres of oxygen does the room contain? _____

5. If gasoline costs 18.2¢ per litre, what would 22.6 litres cost? _____
6. 9 kg of potatoes cost \$1.05. What does 1 kg of potatoes cost (to the nearest tenth of a cent)? _____
7. A pitcher holds 1.05 litre. 9.4 litres are how many pitchers? _____
8. A metre is 100 centimetres.
- A Is a centimetre **more** or **less** than 0.0060524 m? _____
 - B Is a metre **more** or **less** than 98.7624 cm? _____
- How much more or less? _____
9. Ted and Jane were looking for a number that would multiply by itself and give 2 as the product.
- A Ted tried 1.4. What was the product? _____
 - B Jane tried 1.5. What was the product? _____
 - C What is the average of 1.4 and 1.5? _____
 - D What is the product when the average of 1.4 and 1.5 is multiplied by itself? _____

1. For each fraction, write an equivalent fraction with a denominator of 10, 100, or 1000. Then write a decimal for the fraction.

Example: $\frac{9}{20} = \frac{9 \times 5}{20 \times 5} = \frac{45}{100} = 0.45$

A $\frac{3}{5}$

B $\frac{7}{50}$

C $\frac{7}{20}$

D $\frac{3}{8}$

2. Use division to a repeating decimal for each fraction. Carry out the dividing until you find a repeating block of digits.

A $\frac{4}{9}$

B $\frac{5}{12}$

C $\frac{8}{15}$

D $\frac{11}{6}$

3. Carry out each division to the hundredths. Then write the quotient as a mixed-decimal numeral in **hundredths** as in the example.

Example:

$$\begin{array}{r} 0.57 \\ 7 \overline{)4.00} \\ \underline{35} \\ 50 \\ \underline{49} \\ 1 \end{array} \rightarrow 0.57 \frac{1}{7}$$

A $8 \overline{)7}$

B $12 \overline{)5}$

C $45 \overline{)31}$

4. Find the quotients. Round the answer as directed.

Example:

$$\begin{array}{r} 0.42 \\ \hline \end{array}$$

(Rounded to the nearest hundredth)

A $\underline{\hspace{2cm}}$

(Rounded to the nearest tenth)

B $\underline{\hspace{2cm}}$

(Rounded to the nearest thousandth)

C $\underline{\hspace{2cm}}$

(Rounded to the nearest hundredth)

$$\begin{array}{r} 0.416 \\ 1.4 \overline{)0.5830} \\ \underline{56} \\ 23 \\ \underline{14} \\ 90 \\ \underline{84} \\ 6 \end{array}$$

9 $\overline{)4.}$

0.8 $\overline{)0.46856}$





2.3 $\overline{)0.1978}$

1. Complete the sentences correctly for the number 0.3247

- A 4 in the _____ place means $4 \times$ _____.
- B 2 in the _____ place means $2 \times$ _____.
- C 3 in the _____ place means $3 \times$ _____.
- D 7 in the _____ place means $7 \times$ _____.

2. Write a decimal or a mixed numeral. A $4\frac{345}{1000} =$ _____ B $5.406 =$ _____

3. Give the correct sign ($<$, $=$, or $>$) for each .

- A 56.99  57.09 B 0.1  0.099 C 0.100  0.10 D 0.99  1.01

4. Perform the indicated operation.

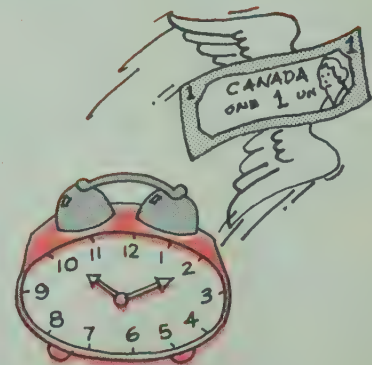
- A
$$\begin{array}{r} 26.95 \\ + 43.17 \\ \hline \end{array}$$
 B
$$\begin{array}{r} 346.25 \\ - 129.37 \\ \hline \end{array}$$
 C
$$\begin{array}{r} 4.75 \\ \times 0.6 \\ \hline \end{array}$$
 D
$$0.5 \overline{)43.85}$$
 E
$$7.8 \overline{)0.7432}$$

5. If an automobile will go 8.6 km while using one litre of gasoline, how far can it travel using 16.8 litres? _____

CHANGE OF PACE

If you gave away \$1 each minute:

- How many dollars would you give away in a day? _____
- How many dollars would you give away in 100 days? _____ 1000 days? _____
- About how many years would it take you to give away one million dollars? _____
- About how many years would it take you to give away one billion dollars? _____
- If there are 200 million people in the United States and you divided one billion dollars equally among the people, how much would each person get? _____

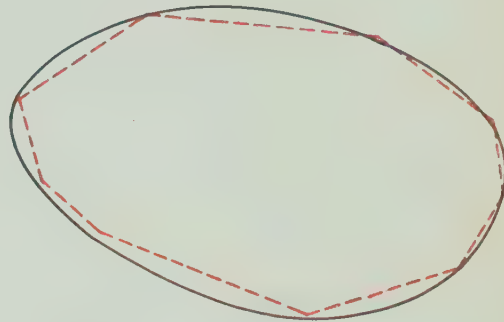


1. This string  can form this loop. 

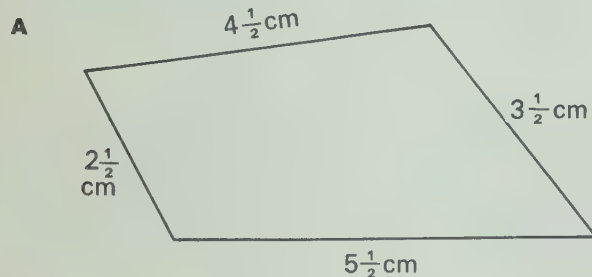
- A The **length** of the string is _____ centimetres.
- B The **perimeter** of the loop is _____ centimetres.

2. Use a centimetre ruler to find the length of each dotted segment.

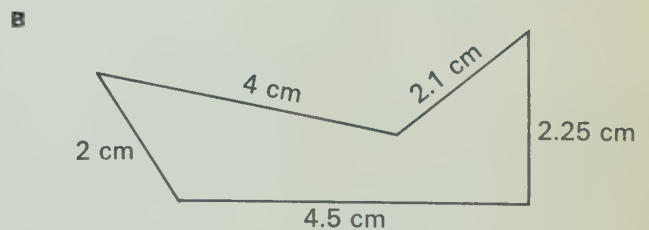
- A The sum of the lengths of all the segments is _____ centimetres.
- B The estimated **perimeter** of the oval is about _____ centimetres.



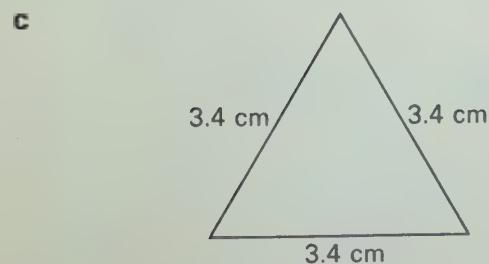
3. Find the perimeter of each polygon.



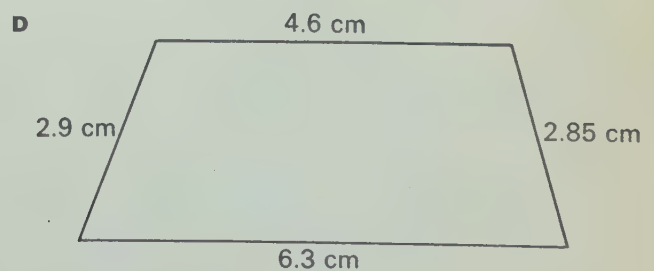
_____ centimetres



_____ centimetres



_____ centimetres

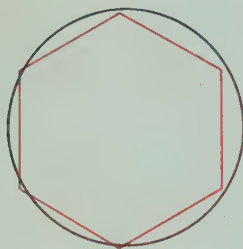


_____ centimetres

For each exercise, use a centimetre ruler to find **the perimeter of the polygon** inscribed in the circle. Then use this measurement to help you **estimate the circumference of the circle**. Finally, use the formula given below to **calculate the circumference of the circle**.

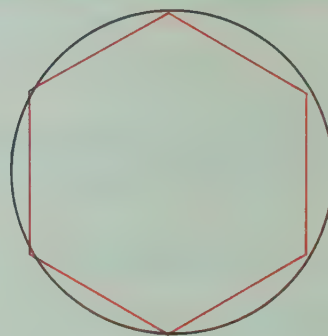
Circumference = $\pi \times$ diameter, where $\pi = 3.14$ (to the nearest hundredth).

1.



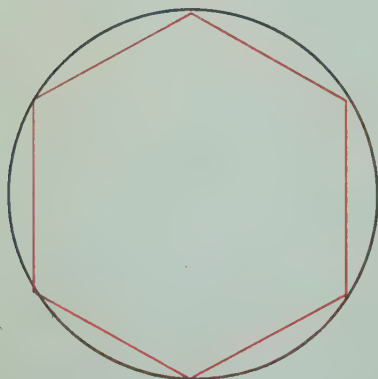
- A The estimated perimeter of the polygon is about _____ cm.
- B The estimated circumference of the circle is about _____ cm.
- C The calculated circumference of the circle is _____ cm.

2.



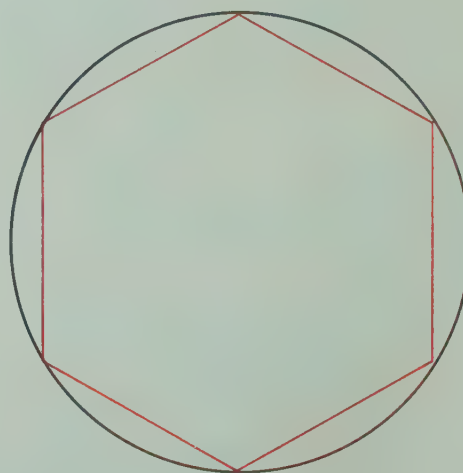
- A The estimated perimeter of the polygon is about _____ cm.
- B The estimated circumference of the circle is about _____ cm.
- C The calculated circumference of the circle is _____ cm.

3.



- A The estimated perimeter of the polygon is about _____ cm.
- B The estimated circumference of the circle is about _____ cm.
- C The calculated circumference of the circle is _____ cm.

4.



- A The estimated perimeter of the polygon is about _____ cm.
- B The estimated circumference of the circle is about _____ cm.
- C The calculated circumference of the circle is _____ cm.

1. We find the **area** of a rectangle by finding the number of square units it takes to "cover" the rectangle. Use the figures to complete the table.

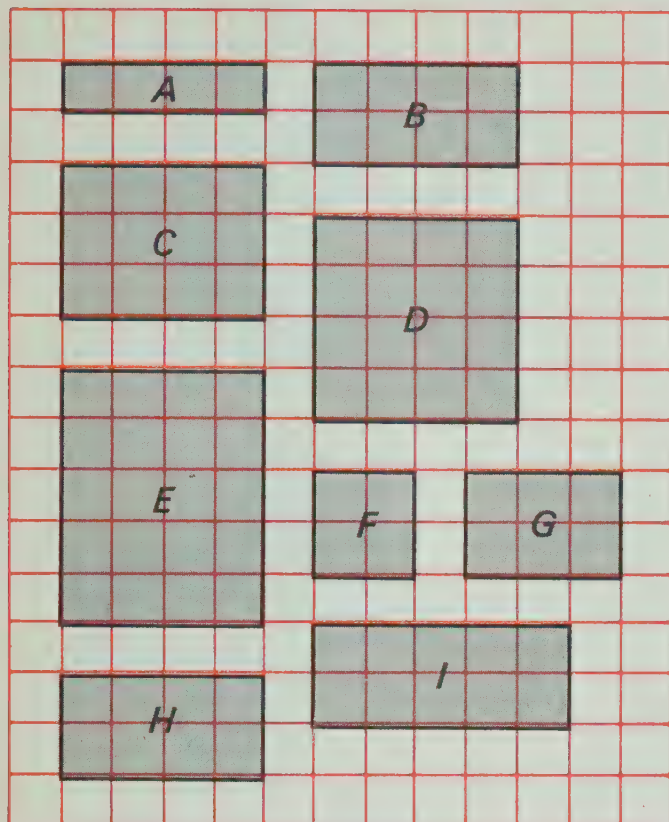
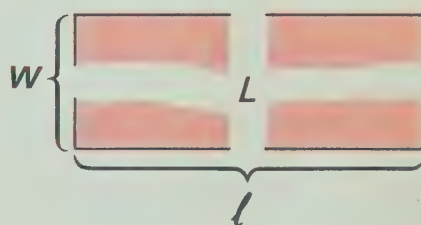
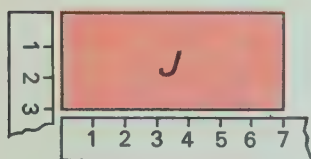
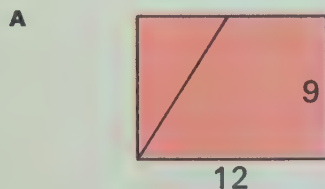


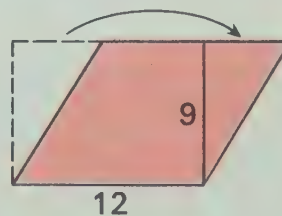
Figure	ℓ (length)	w (width)	A (area)
A	4		
B			
C			
D			
E			
F			
G			
H			
I			
J			
K			
L	ℓ	w	



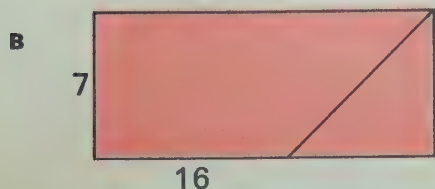
2. Find the area of the rectangular region. Then find the area of the parallelogram.



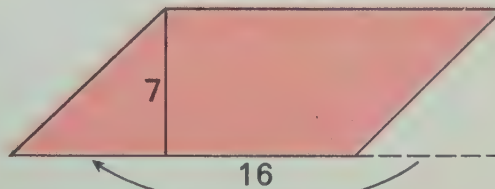
Area: _____ square units



Area: _____ square units



Area: _____ square units

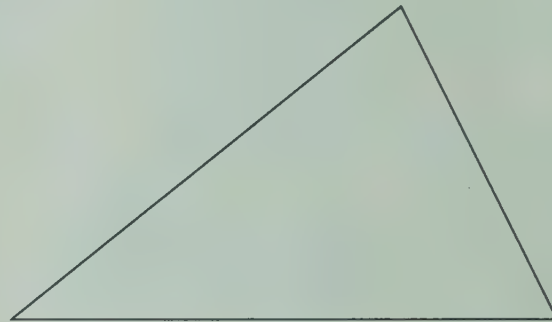
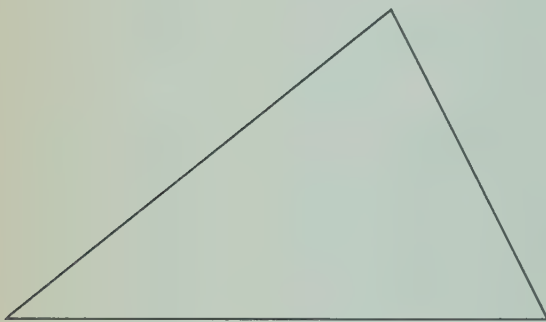
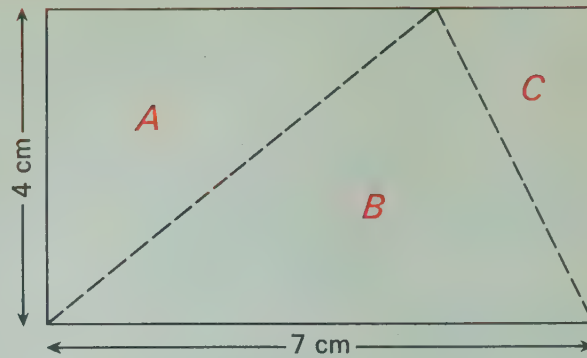


Area: _____ square units

● Area of a Triangle

1. **A** Trace this rectangle, cut it out, and then cut along the dotted lines.

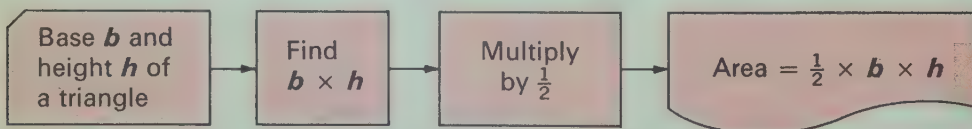
B Show that pieces of this rectangle can be placed to completely cover the two triangles below with nothing left over.



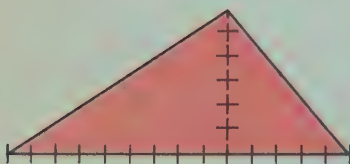
2. Refer to the figures in exercise 1 to complete the following.

- A** The rectangle is _____ centimetres long and _____ centimetres wide.
- B** The area of the rectangle is _____ square centimetres.
- C** Since the rectangle can be cut exactly to cover **two** triangles of equal size, the area of **one** of the triangles is _____ the area of the rectangle.
- D** The area of one of the triangles is _____ square centimetres.

3. Use the flow chart to help you find the area of the following triangles.

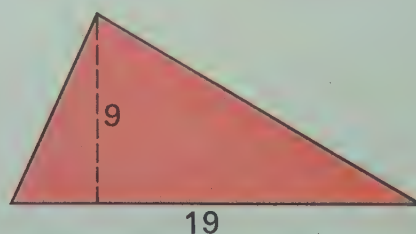


A



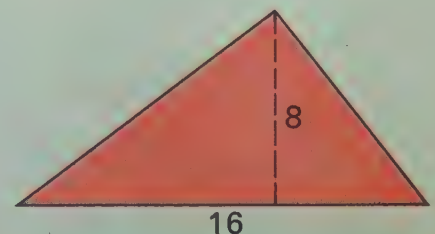
Area = _____ units

B



Area = _____ units

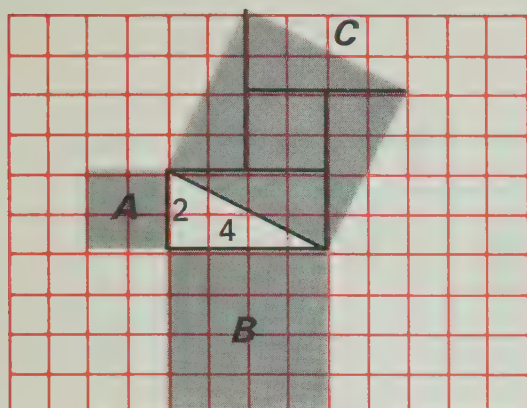
C



Area = _____ units

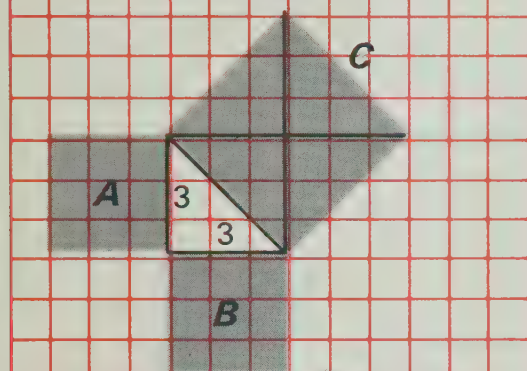
These exercises will help you become more familiar with the famous theorem about the sides of a right triangle that was proved by the Greek mathematician, Pythagoras. Study the figures on the left and complete the statements on the right.

- 1.



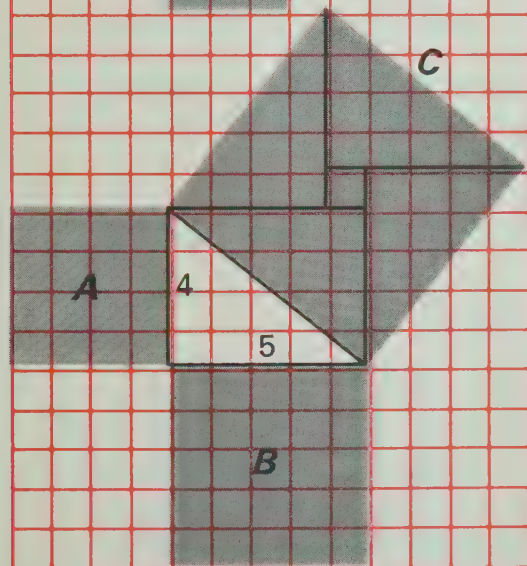
- A** Area of square $A = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ square units
- B** Area of square $B = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$ square units
- C** Area of square A
+ Area of square $B = \underline{\hspace{2cm}}$ square units
- D** By counting square units, we see
that the area of square $C = \underline{\hspace{2cm}}$ square units

- 2.



- A** Area of square $A = \underline{\hspace{2cm}}$ square units
- B** Area of square $B = \underline{\hspace{2cm}}$ square units
- C** Area of square A
+ Area of square $B = \underline{\hspace{2cm}}$ square units
- D** By counting square units, we see that
the area of square $C = \underline{\hspace{2cm}}$ square units

- 3.



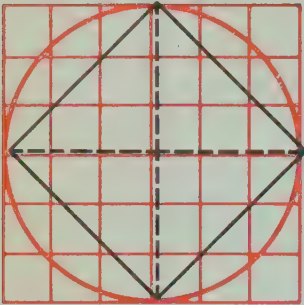
- A** Area of square $A = \underline{\hspace{2cm}}$ square units
- B** Area of square $B = \underline{\hspace{2cm}}$ square units
- C** Area of square A
+ Area of square $B = \underline{\hspace{2cm}}$ square units
- D** By counting square units, we see that the
area of square $C = \underline{\hspace{2cm}}$ square units

4. Complete this statement about the squares on the sides of a right triangle.

"The area of square _____ plus the area of square _____ equals _____."

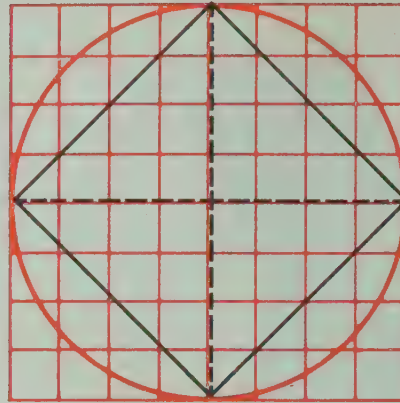
For each exercise, find the area of the squares and their average area. Then use the formula $A = \pi \times r^2$ (use $\pi = 3.14$) to find the approximate area of the circle.

1.



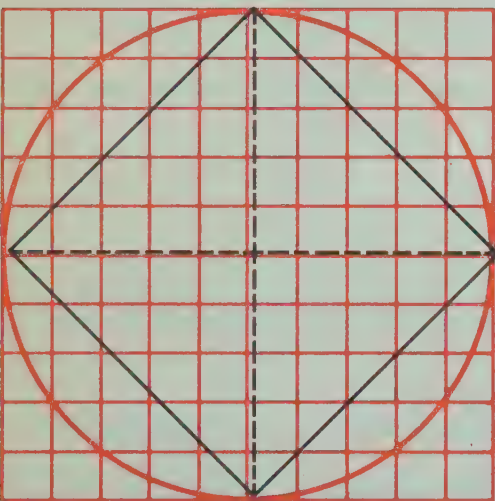
- A Area of large square: _____ units
- B Area of small square: _____ units
- C Average area of squares: _____ units
- D Area of circle: _____ units

2.



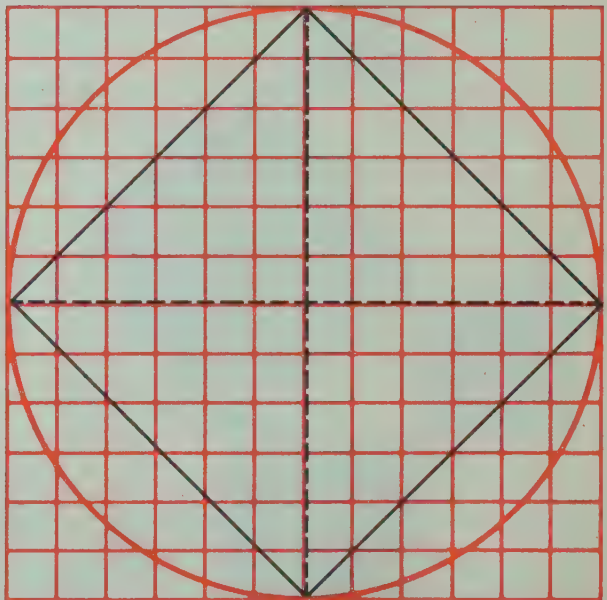
- A Area of large square: _____ units
- B Area of small square: _____ units
- C Average area of squares: _____ units
- D Area of circle: _____ units

3.



- A Area of large square: _____ units
- B Area of small square: _____ units
- C Average area of squares: _____ units
- D Area of circle: _____ units

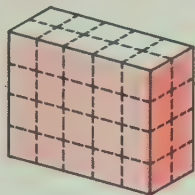
4.



- A Area of large square: _____ units
- B Area of small square: _____ units
- C Average area of squares: _____ units
- D Area of circle: _____ units

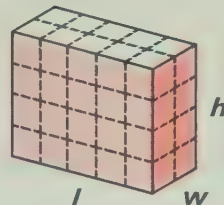
1. We can find the **volume** of a rectangular prism by **counting cubes** or **using a formula**.

A



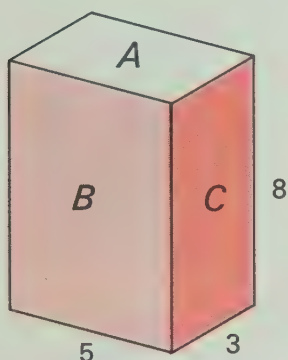
By counting cubes, the volume is _____ cubic units.

B



By using the formula $V = l \times w \times h$, the volume is _____ \times _____ \times _____ = _____ cubic units.

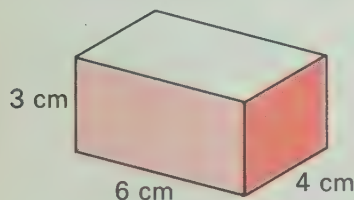
2. We can find the **surface area** of a figure by finding the sum of the areas of all faces.



- A Area of face A is _____ square units.
- B Area of the face opposite face A is _____ square units.
- C Area of face B is _____ square units.
- D Area of the face opposite face B is _____ square units.
- E Area of face C is _____ square units.
- F Area of the face opposite face C is _____ square units.
- G Total surface area of the solid is _____ square units.

3. Find the **volume** and **surface area** of each figure.

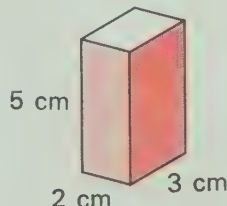
A



Volume: _____ cm^3

Surface area: _____ cm^2

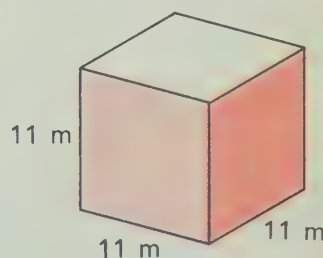
B



Volume: _____ cm^3

Surface area: _____ cm^2

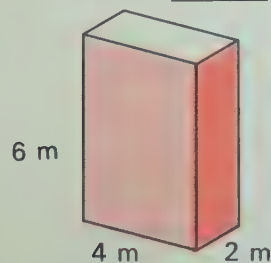
C



Volume: _____ m^3

Surface area: _____ m^2

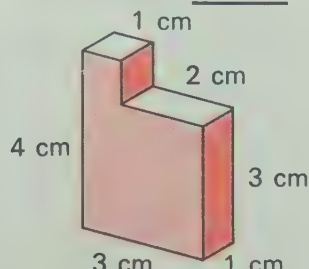
D



Volume: _____ m^3

Surface area: _____ m^2

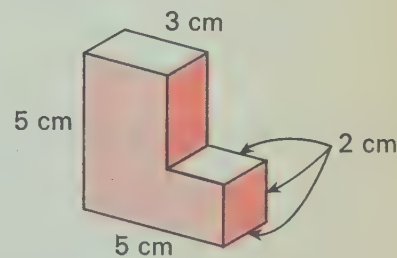
E



Volume: _____ cm^3

Surface area: _____ cm^2

F

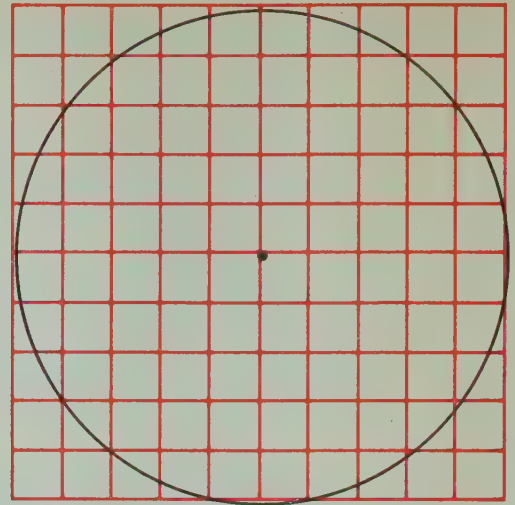


Volume: _____ cm^3

Surface area: _____ cm^2

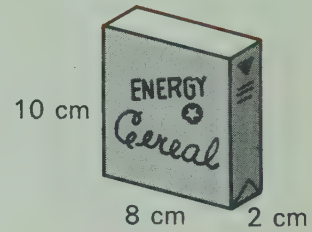
1. Refer to the circle at the right to complete each sentence.

- A Using the formula $C = \pi \times \text{diameter}$, the calculated circumference of the circle is _____ units.
- B By counting squares, the estimated area of the circle is _____ units.
- C Using the formula $A = \pi \times (\text{radius})^2$, the calculated area of the circle is _____ units.

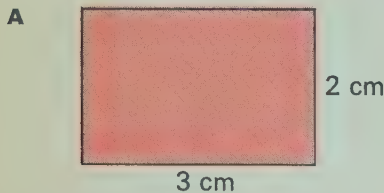


2. Find the volume and surface area of the cereal box.

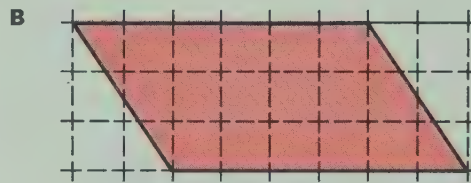
- A Volume: _____ cm^3
- B Surface area: _____ cm^2



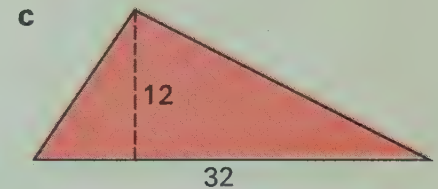
3. Find the area of each figure.



Area: _____ cm^2



Area: _____ units



Area: _____ units

CHANGE of PACE

Choose any one of these numbers and write it down. Draw a line through the numbers in the same row and column as the number you chose. Pick another number (not crossed out) and repeat this procedure. Continue until all the numbers are crossed out.

1. What is the sum of your chosen numbers? _____

2. Try this again, choosing different numbers.

What is the sum of these numbers? _____

3. Do you think the sum will be the same every time? _____

199	63	48	381	162
174	38	23	356	137
162	26	11	344	125
251	115	100	433	214
355	219	204	537	318

1. Give the co-ordinates (number pairs) for the point beside each letter on the graph.

A: (2, $3\frac{1}{2}$) I: (____, ____)

B: (____, ____) J: (____, ____)

C: (____, ____) K: (____, ____)

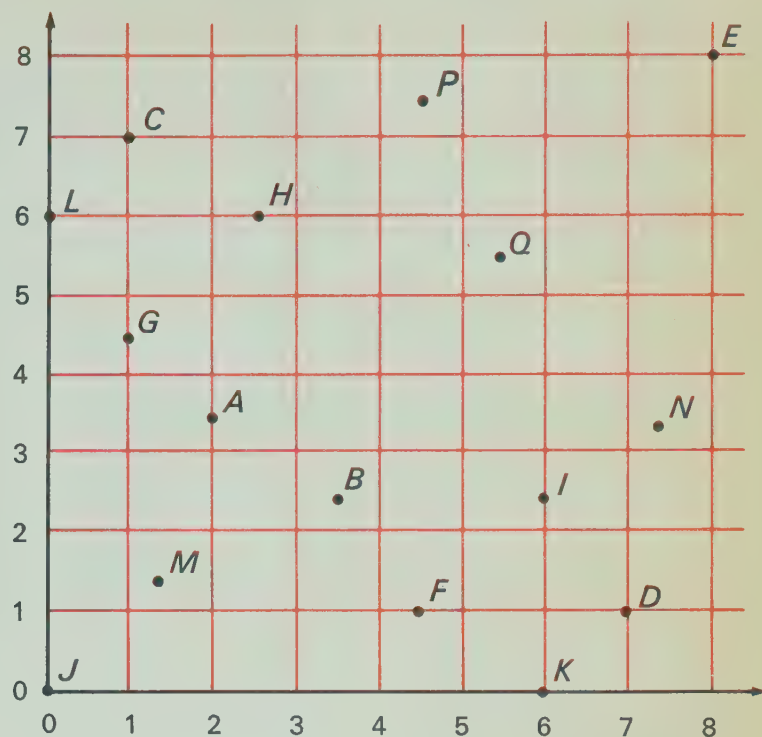
D: (____, ____) L: (____, ____)

E: (____, ____) M: (____, ____)

F: (____, ____) N: (____, ____)

G: (____, ____) P: (____, ____)

H: (____, ____) Q: (____, ____)



2. Graph each number pair. Label each point with the letter of the number pair.

A: (7, 6) I: ($2\frac{1}{2}$, $2\frac{1}{2}$)

B: (6, 7) J: ($7\frac{1}{2}$, $6\frac{1}{2}$)

C: (3 , $4\frac{1}{2}$) K: (2, 0)

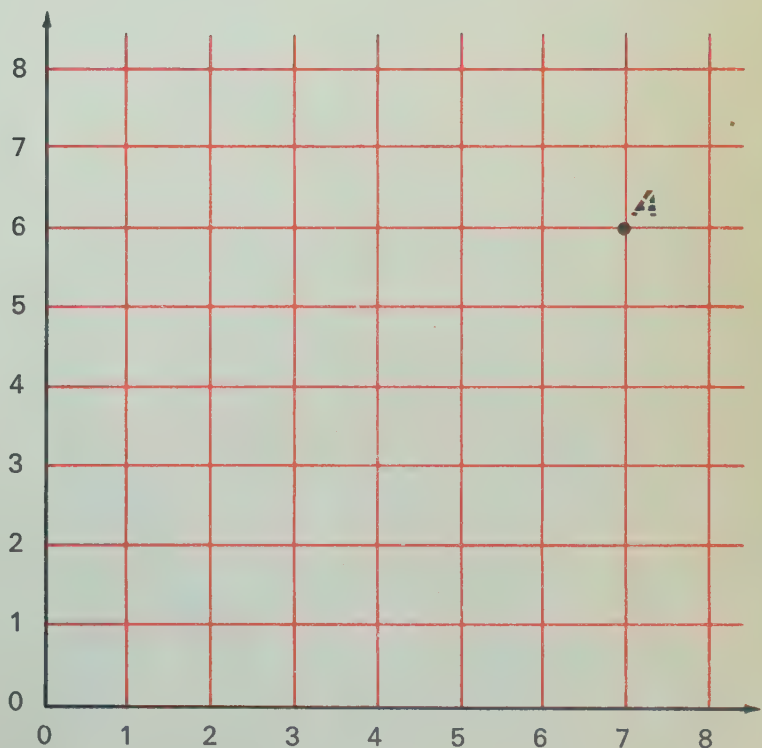
D: ($4\frac{1}{2}$, 3) L: (0, 7)

E: ($7\frac{1}{2}$, $2\frac{1}{2}$) M: (0, $4\frac{1}{2}$)

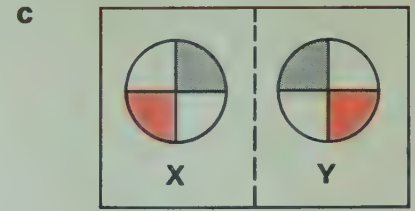
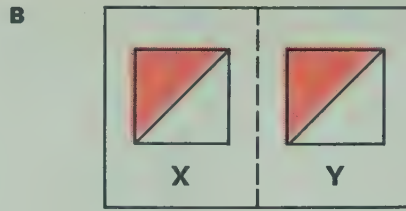
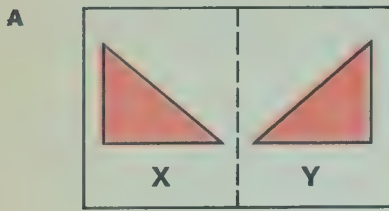
F: ($2\frac{1}{2}$, $7\frac{1}{2}$) N: ($5\frac{1}{2}$, 0)

G: ($3\frac{1}{2}$, 8) P: ($1\frac{1}{2}$, $6\frac{1}{2}$)

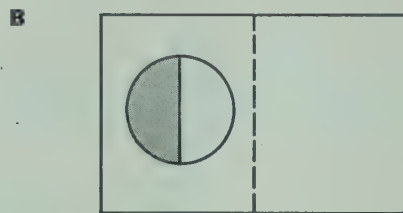
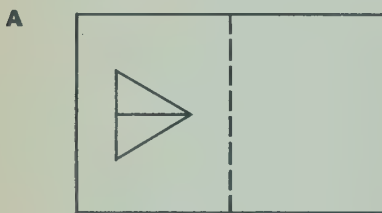
H: (6, $5\frac{1}{2}$) Q: ($5\frac{1}{2}$, $5\frac{1}{2}$)



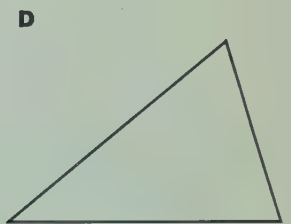
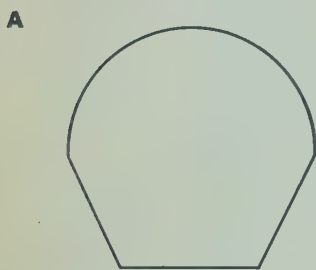
1. Is figure **Y** a reflection of figure **X**? Answer **yes** or **no**.
(Think of the dotted line as fold line.)



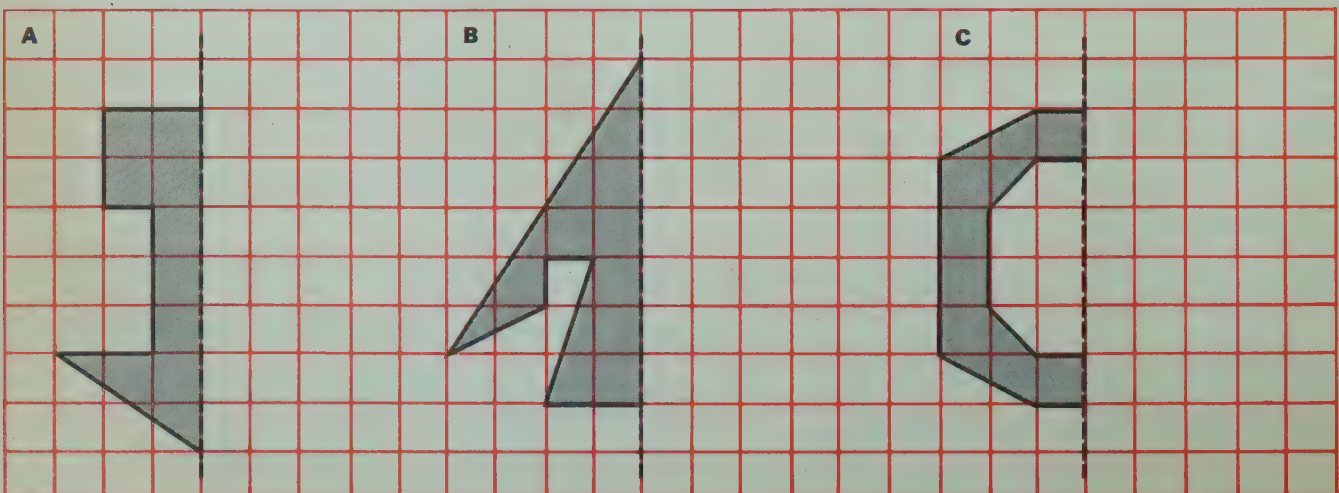
2. Draw the reflection image in the other half of the rectangle.



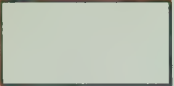
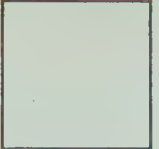
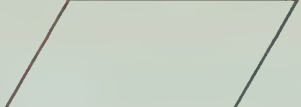
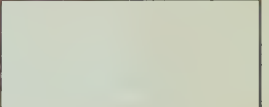
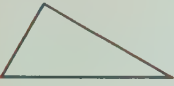
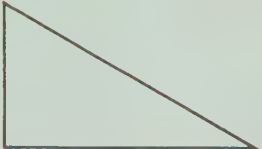


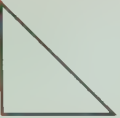
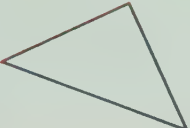



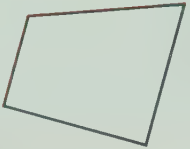
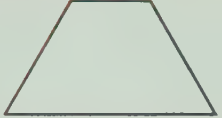
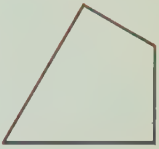
3. Draw the line of symmetry for each figure.



4. Draw the other half of the figure so that the dotted line is a line of symmetry.



1. Place a ✓ inside the polygon that has the same shape as the first one.

A 			
B 			
C 			
D 			

2. Refer to the graph at the right to answer the questions.

A Give the co-ordinates of each point.

A: (____, ____) B: (____, ____)

C: (____, ____)

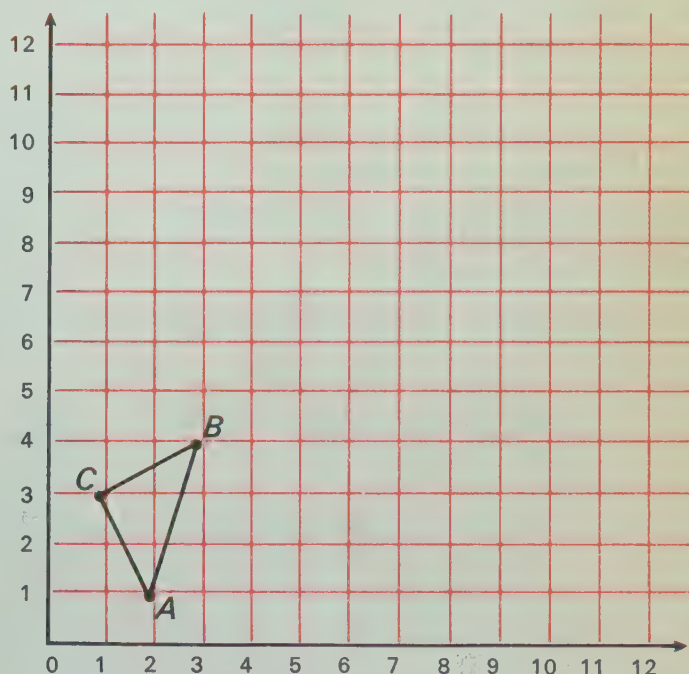
B Triple the co-ordinates of points A, B, and C in part A.

A': (____, ____) B': (____, ____)

C': (____, ____)

C Draw a triangle with new points A', B' and C' as vertices.

D Are the two triangles similar? _____



1. Graph each number pair.

A: (3, 5)

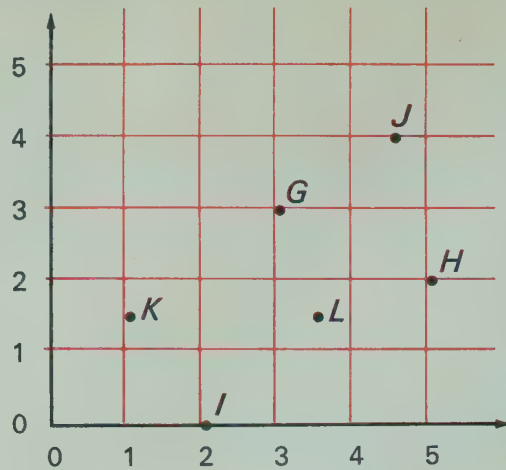
B: ($\frac{1}{2}$, 4)

C: (4, $\frac{1}{2}$)

D: ($3\frac{1}{2}$, 0)

E: ($1\frac{1}{2}$, $4\frac{1}{2}$)

F: (0, $3\frac{1}{2}$)



2. Give the co-ordinates for points G through L.

G: (____, ____)

H: (____, ____)

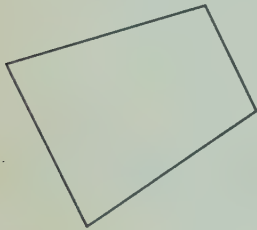
I: (____, ____)

J: (____, ____)

K: (____, ____)

L: (____, ____)

3. Draw the line of symmetry for the figure.



4. Which pair of shapes are similar? _____



CHANGE OF PACE

Across

1. $33 + 19$
3. The only prime number between 31 and 41
5. Least common denominator of $\frac{5}{6}$ and $\frac{3}{8}$
6. 7.5×10
8. Largest 3-digit number
10. $0.25 \times \text{|||||} = 40$
12. 57×32
14. $37\frac{3}{5}$ rounded to the nearest whole number
16. $4 \times 9\frac{1}{2}$
17. The prime factors of 210, listed from smallest to largest, are |||||, |||||, |||||, |||||
19. A dozen dozen
20. $2436 \div 6$

21. $18\frac{1}{3} + 9\frac{1}{4} + 3\frac{5}{12}$
23. $23.75 + 12.8 + 6.93 + 7.52$
24. $232_{(base\ 6)} = \text{|||||}_{(base\ 10)}$
25. $5628 \div 84$

Down

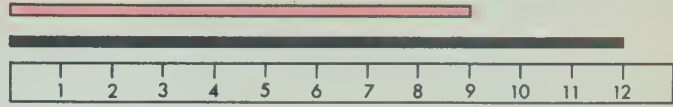
2. 3^3
4. $70 + (8 \times 9 \times 10)$
5. $(713 \times 35) + 4980$
7. 2^9
9. $25.04 \div 0.08$
11. 8^2

1	2		3	4		5	
	6	7		8			
9		10	11				
12	13					14	15
16				17	18		
			19				
	20				21	22	
23			24			25	

13. $100\ 000 - 11\ 559$
15. $(25 \times 25) + (25 \times 10)$
17. $72 \times \frac{1}{3}$
18. 7^3
19. 13^2
22. $\text{|||||} \times \text{|||||} = 256$

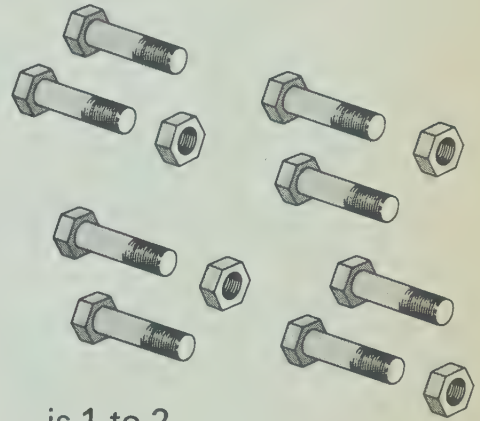
Write the correct word in each blank. Give the correct number for each .

1. You can use ratios to compare the lengths of two objects.



- A The ratio of the length of the **colored** rod to that of the **black** rod is to .
- B The ratio of the length of the **black** rod to that of the **colored** rod is to 9.
- C The ratio of the length of the _____ rod to that of the _____ rod is 4 to 3.
- D The ratio of the length of the **colored** rod to that of the **black** rod is to .

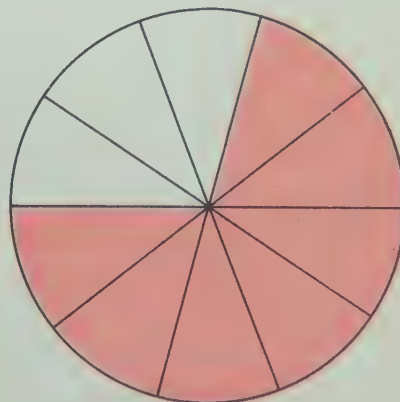
2. You can use ratios to compare the number of objects in two sets.



- A The ratio of the number of **nuts** to **bolts** is to 8.
- B The ratio of the number of **nuts** to **bolts** is to 4.
- C The ratio of the number of **bolts** to **nuts** is to 2.
- D The ratio of the number of _____ to _____ is 1 to 2.

3. You can use ratios to compare a part of a set to a whole set.


- A The circular region is divided into parts of equal size.
- B of the parts are **colored**.
- C The ratio of the _____ parts to all the parts is 7 to .
- D The ratio of the white parts to all the parts is to .

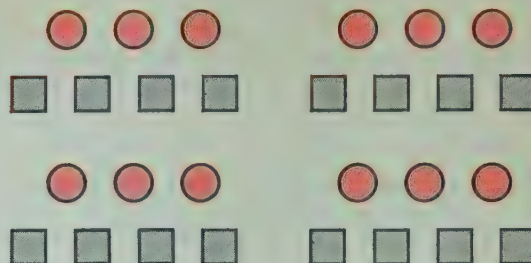


1. Different pairs of numbers can be used to express the same ratio. Give the missing words and numbers.

A The ratio of _____ to _____ is 3:4.

B The ratio of circles to squares is  :8.

C The ratio of circles to squares is  :12.



Since 3:4 and 6:8 are the same ratio, we write $3:4 = 6:8$

2. Complete each sentence.

A 1 table for every 5 children.

3 tables for every _____ children.

C 9 words out of 10 spelled correctly.

_____ words out of 50 spelled correctly.

B 2 candy bars for 15 cents.


_____ candy bars for 45 cents.

D 12 hits out of 40 times at bat.


3 hits out of _____ times at bat.

3. For the first part of each exercise, think about equivalent fractions. For the second part, think about ratios. Find the missing numbers.

A $\frac{1}{3} = \frac{\text{red square}}{6}$

1:3 =  :6


D $\frac{1}{2} = \frac{\text{red square}}{4}$

1:2 =  :4

G $\frac{10}{20} = \frac{\text{red square}}{40}$

10:20 =  :40

J $\frac{2}{9} = \frac{\text{red square}}{18}$

2:9 =  :18

B $\frac{4}{8} = \frac{\text{red square}}{16}$

4:8 =  :16


E $\frac{4}{6} = \frac{\text{red square}}{12}$

4:6 =  :12

H $\frac{9}{18} = \frac{\text{red square}}{2}$

9:18 =  :2

K $\frac{10}{6} = \frac{\text{red square}}{3}$

10:6 =  :3

C $\frac{3}{5} = \frac{\text{red square}}{10}$

3:5 =  :10


F $\frac{3}{2} = \frac{\text{red square}}{4}$

3:2 =  :4

I $\frac{7}{8} = \frac{\text{red square}}{16}$

7:8 =  :16

L $\frac{5}{8} = \frac{\text{red square}}{16}$

5:8 = 10: 

Write a fractional-number equation for each problem. Then solve your equation.

1. Ratio of length of small fish to that of large fish, 2:3. Small fish is 8 cm long. How long is the large fish?

$$\frac{2}{3} = \frac{8}{n}$$

The large fish is 12 cm long.

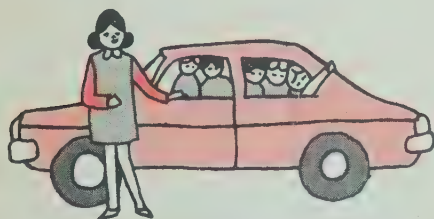
5. Ratio of gadgets made to minutes needed to make them, 104:13. How many gadgets can be made in 1 minute?

_____ gadgets can be made in 1 minute.

2. Ratio of people to cars, 4:1. 8 cars. How many people?

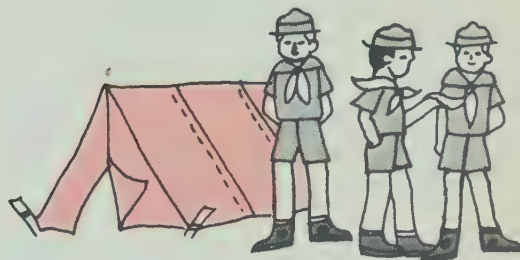
$$\frac{4}{1} = \frac{n}{8}$$

There are _____ people.



6. Ratio of scouts to councillors, 25:1. 125 scouts. How many councillors?

There are _____ councillors.



3. Ratio of sows to baby pigs, 1:8. 192 baby pigs. How many sows?

There are _____ sows.

7. Ratio of brunettes to blondes, 3:5. 12 brunettes. How many blondes?

There are _____ blondes.



4. Ratio of Carl's height to Roger's height, 3:4. Roger's height, 120 cm. What is Carl's height?

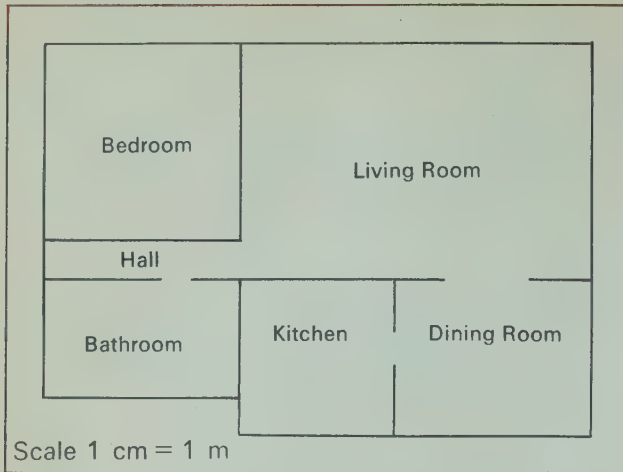
Carl is _____ cm tall.



8. Ratio of weight of gold to weight of iron, 12:5. Piece of iron weighs 20 kg. What is the weight of a piece of gold the same size?

The gold weighs _____ kg.

1.



Give the actual length and width (in metres) of each room.

Bedroom _____

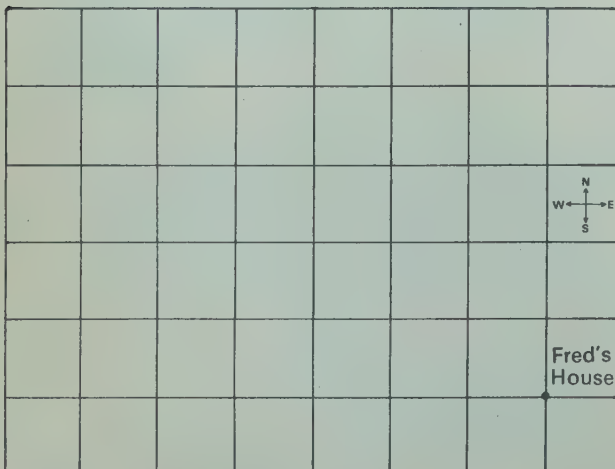
Living Room _____

Dining Room _____

Hall _____

Bathroom _____

2. A. Fred walks to school with Allan and Chuck. Allan lives 1 block west and 4 blocks north of Fred. Allan lives 4 blocks east and 1 block north of Chuck. Chuck lives 3 blocks north and 1 block east of the school. Plot Fred's route to school.



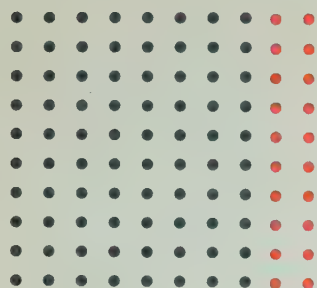
Scale 1 cm = 1 block

- B. B-Ville is 60 kilometres north of A-Town. C-City is 45 east of B-Ville. D-Town is 30 south and 30 east of C-City. Complete the map on the grid below.



Scale 1 cm = 15 kilometres

1. Give the correct numbers for each .



A of the 100 dots are colored.

We say that $\frac{\text{}}{100}$ of the dots are colored.

We also say that 20 percent of the dots are colored.

We write, "20% of the dots are colored."

B $\frac{\text{}}{100}$ of the dots are black. % of the dots are black.

2. Give the correct numerator for each . Then give the decimal, percent, or lowest-terms fraction in each blank.

A $\frac{1}{5} = \frac{20}{100} = 0.20 = 20\%$

E $\frac{\text{}}{100} = \text{} = 40\%$

B $\frac{3}{10} = \frac{\text{}}{100} = \text{} = 30\%$

F $\frac{13}{20} = \frac{\text{}}{100} = \text{} = \text{}$

C $\frac{\text{}}{100} = \text{} = 70\%$

G $\frac{17}{25} = \frac{\text{}}{100} = \text{} = \text{}$

D $\frac{\text{}}{100} = \text{} = \text{}$

H $\frac{43}{50} = \frac{\text{}}{100} = \text{} = \text{}$

3. Give the percents.

A $\frac{10}{100} = 10\%$

B $\frac{14}{100} = \text{}$

C $\frac{83}{100} = \text{}$

D $\frac{7}{100} = \text{}$

4. Give the lowest-terms fractions.

A $23\% = \frac{23}{100}$

B $13\% = \frac{\text{}}{\text{}}$

C $80\% = \frac{\text{}}{\text{}}$

D $4\% = \frac{\text{}}{\text{}}$

5. Give the decimals.

A $75\% = \text{}$

B $18\% = \text{}$

C $88\% = \text{}$

D $6\% = \text{}$

6. Give the percents.

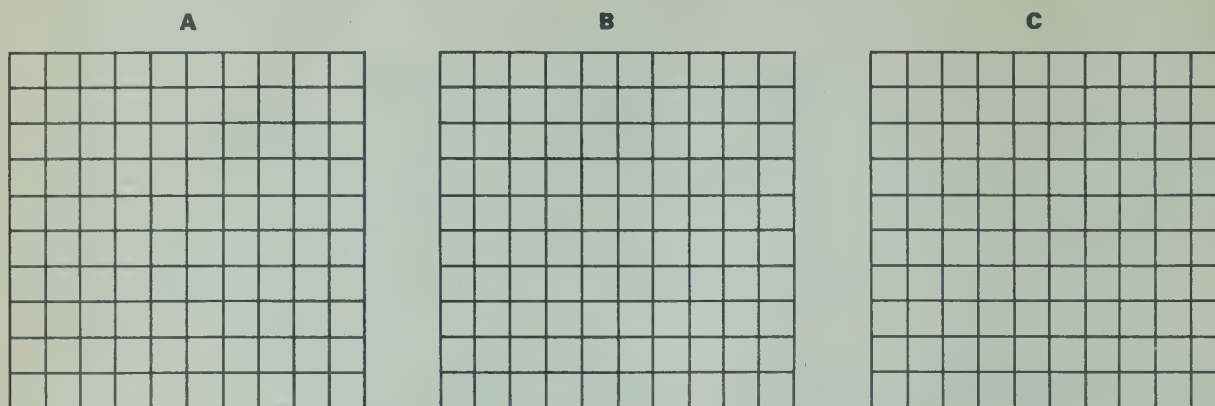
A $0.12 = \text{}\%$

B $0.65 = \text{}\%$

C $0.7 = \text{}\%$

D $0.04 = \text{}\%$

1. Each large square is divided into 100 small squares. One of the small squares is $\frac{1}{100}$ or 1% of the large region.



- A Shade $\frac{1}{4}$ of square A. How many small squares did you shade? _____

What **percent** of the large square region did you shade? _____

We write $\frac{1}{4} =$ %

- B Shade $\frac{1}{3}$ of square B. How many small squares did you shade? _____

What **percent** of the large square region did you shade? _____

We write $\frac{1}{3} =$ %.

- C Shade $\frac{1}{8}$ of square C. How many small squares did you shade? _____

What **percent** of the large square region did you shade? _____

We write $\frac{1}{8} =$ %.

2. Give the missing percents.

A $\frac{1}{8} =$ $\frac{1}{8} =$ %
 $+\frac{1}{8} =$ $+\frac{1}{8} =$ %
 $\frac{2}{8} = \frac{1}{4} = 25\%$

B $\frac{2}{8} =$
 $+\frac{1}{8} =$
 $\frac{3}{8} =$

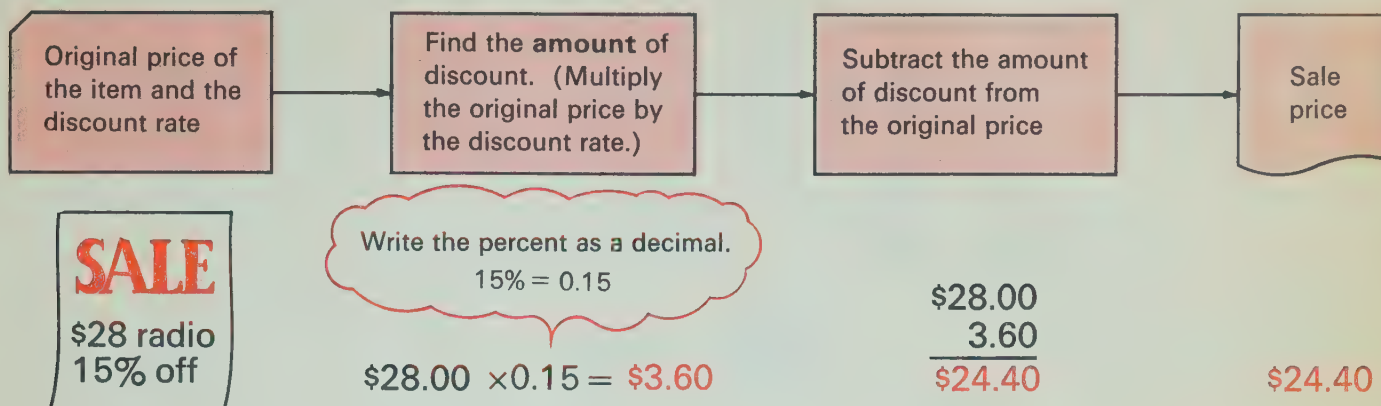
C $\frac{4}{8} =$
 $+\frac{1}{8} =$
 $\frac{5}{8} =$

D $\frac{5}{8} =$
 $+\frac{2}{8} =$
 $\frac{7}{8} =$

E $\frac{1}{3} =$
 $+\frac{1}{3} =$
 $\frac{2}{3} =$

F $\frac{1}{6} =$
 $+\frac{1}{6} =$
 $\frac{2}{6} = \frac{1}{3} = 33\frac{1}{3}\%$

Follow the steps in the flow chart to find the amount of discount and the sale price.



1. Complete the table. Find the amount of discount and the sale price.

	A	B	C	D	
Original price	\$3.00	\$18.95	\$78.00	\$96.00	\$49.90
Discount rate	25%	20%	30%	33⅓%	10%
Amount of discount	\$.75				
Sale price	\$2.25				

2. Solve each story problem.

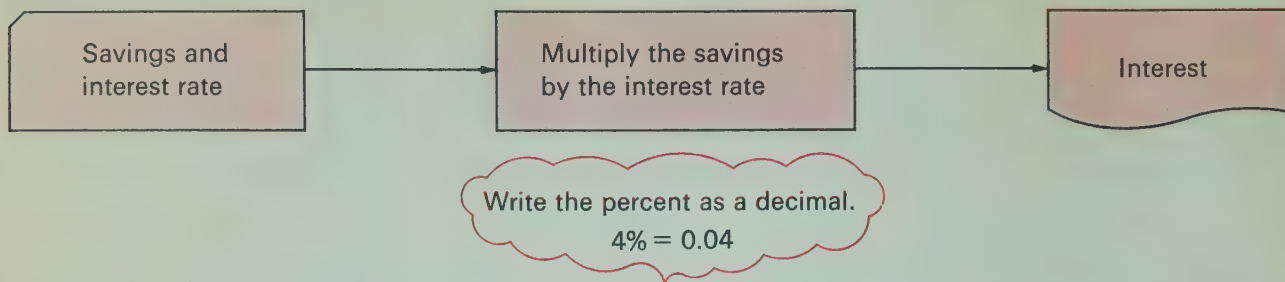
A Karen bought a \$12 dress at a "20% off" sale. How much did she pay for the dress on sale? _____

c Craig bought an \$8.95 model ship kit at a discount of 40%. What was the sale price of the kit? _____

B Canned cat food costs 20¢ per can. If Mr. Bates buys a case of 24 cans, he gets a 10% discount. What does he pay for a case of canned cat food with the discount? _____

D At a "1/3" off" remnant sale, Nancy bought four metres of wool material regularly priced at \$3.95 per metre. What did she pay for the four metres of material on sale? _____

Follow the steps in the flow chart to find the amount of interest.



Savings: \$85.00
Interest rate: 4%

$$\$85.00 \times 0.04 = \$3.40$$

1. Give the missing entries in the table.

	A	B	C	D	E
Savings	\$25.00	\$130.00	\$575.00	\$137.50	\$850.00
Interest rate (per year)	6%	3%	5%	4%	4½%
Amount of interest					
Savings + interest					

2. Solve each story problem.

- A How much would you earn if you had \$271 in your savings account at 4% interest per year?

- C How much money would Mrs. Karmon earn on her savings account after only 6 months if she earns 5%

interest per year? _____

- B Mr. Muncey has \$450 in his savings account and earns 5% interest per year. How much money does he have in his account

after one year? _____

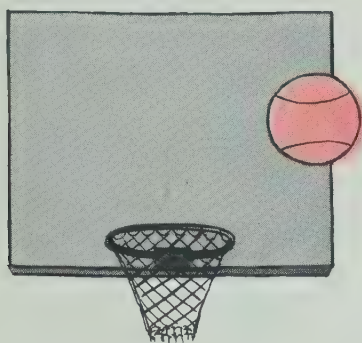
- D How much money would Mr. Ramus have in his savings account after one year if he had \$395 in his account at an interest

rate of 6%? _____

1. Judy completed 23 of the 25 problems on the test correctly.

- A What fraction of the problems did she solve correctly? _____
- B What percent of the problems were correct? _____

2. Ted made 3 out of 5 free throws. If he continues to make about 3 out of every 5 free throws he shoots, what percent of his free-throw tries will be successful? _____



3. Tom put \$325 into a savings account at the bank. Each year he received 4% interest on his money.

- A How much money did he have at the end of the first year? _____
- B How much did he have at the end of the second year? _____

4. A man earned \$7500. He paid 18% of this in taxes. How much did he pay? _____

5. There are 5964 families in Crescent City. 75% of the families own a home. How many families in Crescent City own a home? _____



6. A 500-litre oil tank is 62% full. How many litres does it contain? _____

7. A suit originally cost \$80. It was on sale for 20% off.

- A How much was to be subtracted from the original price? _____
- B What was the sale price? _____

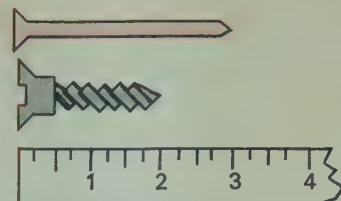
8. A salesman's salary was 3% of the money he made from sales. His total sales for January were \$17 367.

- A What was his salary? _____
- B If he pays 23% of his salary as taxes, how much tax does he pay on his January salary? _____

1. Give the correct number in each

A The ratio of the length of the nail to the screw is : .

B The ratio of the length of the screw to the nail is : .



2. Complete each statement about equal ratios.

A $1:5 = \text{ } :10$

B $\text{ } :3 = 6:9$

C $3:\text{ } = 6:14$

D $3:4 = 12:\text{ }$

3. The ratio of the number of words Sue typed to the number of minutes she typed was 104:4. How many words did Sue type in one minute? 26

4. Give the correct numerator for each . Then write the percent or lowest-terms fraction in the blank.

A $\frac{7}{25} = \frac{\text{ }}{100} = \text{ }$

B $\frac{9}{20} = \frac{\text{ }}{100} = \text{ }$

G $\text{ } = \frac{\text{ }}{100} = 35\%$

5. Write the correct percents.

A $\frac{1}{3} = \text{ }\%$

C $\frac{1}{8} = \text{ }\%$

E $\frac{3}{8} = \text{ }\%$

G $\frac{5}{8} = \text{ }\%$

B $\frac{2}{3} = \text{ }\%$

D $\frac{2}{8} = \text{ }\%$

F $\frac{4}{8} = \text{ }\%$

H $\frac{7}{8} = \text{ }\%$

6. Mr. Jones borrowed \$500 from the bank.
He paid 6% interest on the money.
How much did it cost him to borrow the money?

CHANGE OF PACE

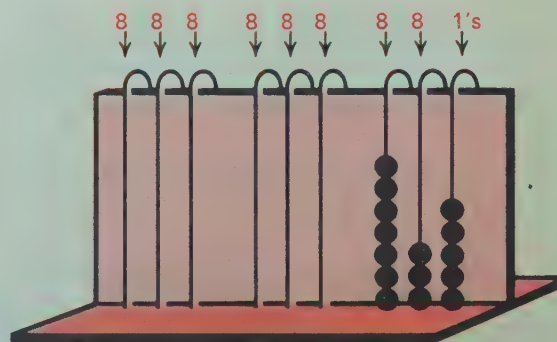
This is a **base-8** abacus. It has 7 beads on each wire. The colored numerals show the **place value** of each bead.

1. A What base-8 number is shown on the abacus?

B What is this number in base 10?







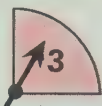
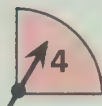

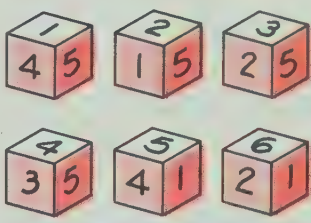


2. A Draw enough more beads on the abacus to show the base-8 number 13,746.

B What is this number in base 10?



BASE-8 ABACUS

1. Predict, as closely as you can, the answers to the questions below.

Experiment	Possible Outcomes	Question
A Toss a penny 100 times. 	  Heads Tails	About how many heads in 100 tosses? _____
B Spin the arrow on the spinner 80 times. 	   	About how many times will the arrow stop in region 1? _____
C Roll a cube 60 times with faces numbered 1, 2, 3, 4, 5, and 6, and record the top numeral. 		About how many times will a 3 appear on the top face? _____
D Toss four pennies at a time and record how many came up heads or tails. Do this 40 times. 		About how many times will 2 heads and 2 tails come up? _____

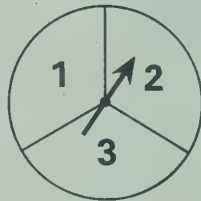
2. Try one or more of the experiments shown above. Compare your results with your answers in parts A through D.

Experiment	Number of tries	Actual Outcome
A	_____	_____
B	_____	_____
C	_____	_____
D	_____	_____

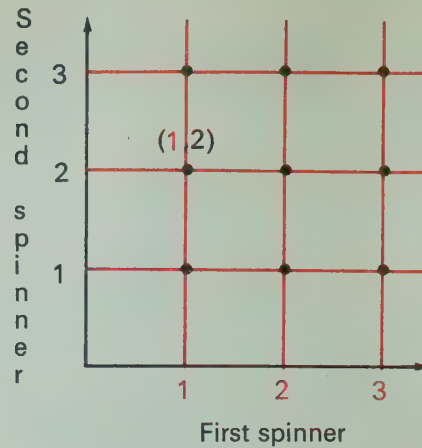
Two spinners are divided into three parts of the same size. When the arrows on both spinners are spun, an ordered pair of numbers such as (1,2) is one of the outcomes.



First spinner



Second spinner



1. Complete the grid above, writing the correct number pair for each point.
2. How many different outcomes are there? _____

3. Suppose the two arrows on the spinners are spun and the sum of the numbers on the spinners are recorded.

- A What is the smallest possible sum? _____
- B What is the largest possible sum? _____

Pair	Sum
(1,1)	2
(1,2)	3
⋮	⋮

4. The sum of 2 can occur in only one way: the pair (1,1) must be spun. Give the number of ways each of these sums can occur.

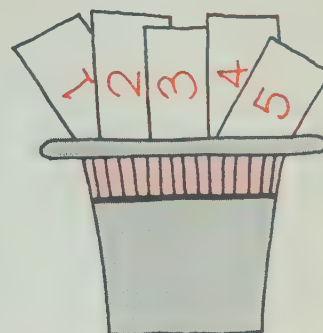
- A 3: _____ B 4: _____ C 5: _____ D 6: _____

5. Which sum is most likely to occur when both spinners are spun? _____

6. If you spun the arrows on both spinners 60 times, about how many times would you expect to get a sum of 4? _____

1. Suppose you draw one card from the hat without looking.

- A There is _____ chance in _____ of drawing a 4.
- B The **probability** of drawing a 4 is _____.
- C The chances of drawing a 3 are _____ in _____.
- D The probability of drawing a 3 is _____.
- E The chances of drawing a 1 are _____ in _____.
- F The probability of drawing a 1 is _____.



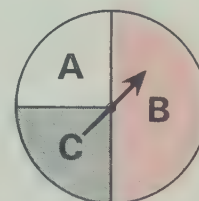
2. Suppose you draw a marble from the box without looking.

- A There are _____ chances in _____ of drawing a red marble.
- B The **probability** of drawing a red marble is _____.
- C There are _____ chances in _____ of drawing a white marble.
- D The probability of drawing a white marble is _____.
- E The chances of drawing a black marble are _____ in _____.
- F The probability of drawing a black marble is _____.

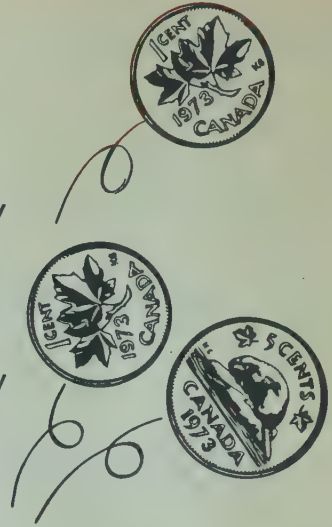


3. A spinner like the one at the right is spun.

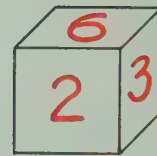
- A The probability of the arrow stopping on **A** is _____.
- B The probability of the arrow stopping on **B** is _____.
- C The probability of the arrow stopping on **C** is _____.
- D If the arrow is spun 100 times, about how many times would it stop on **A**? _____ on **B**? _____ on **C**? _____



1. If you flipped a penny 1000 times, about how many times would you expect heads to appear? _____ tails? _____
2. If you flipped a penny and a nickel 800 times, about how many times would you expect both coins to land heads up? _____
3. If you flipped a penny and a nickel 800 times, about how many times would you expect to get a head and a tail? _____
4. If you flipped two coins many times, which of these outcomes would probably occur most often? (Ring one)
 A Two heads B Two tails C One head, one tail



5. A cube with its faces numbered 1 through 6 is tossed.
 A There is _____ chance in _____ that the numeral 5 will be on the top face.
 B The **probability** that 5 will be on top is _____.
 C The probability of getting a number getting a number greater than 2 on the top face is _____.
 D The probability of getting a number less than 3 is _____.



CHANGE OF PACE

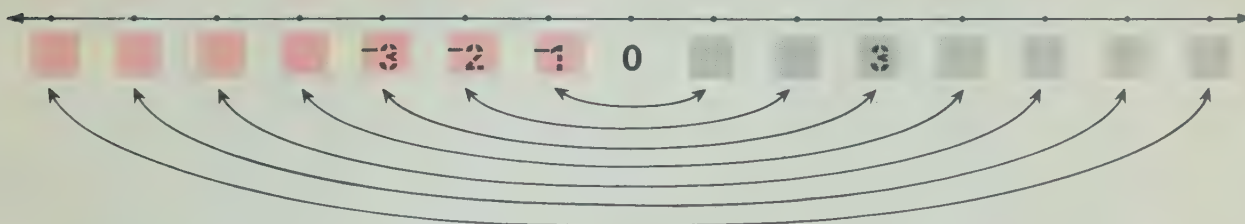
There is something special about each of these multiplication problems. Find the products, then in the space below tell why the problems are unusual.

$$\begin{array}{r} 51\,249\,876 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 32\,547\,891 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 16\,583\,742 \\ \times 9 \\ \hline \end{array}$$

1. Write the symbol for a whole number (**positive number**) in the correct .
Then write the symbol for the **negative number** that matches with it in the correct .



2. Give the missing numbers.

A is the **opposite** of 3.

E is the **opposite** of 35.

B is the **opposite** of -3.

F is the **opposite** of -21.

C is the **opposite** of -5.

G is the **opposite** of -874.

D is the **opposite** of 5.

H is the **opposite** of 50.

3. Give the integer that best fits each description.

A Gained 5 kg: 5

E Four steps forward: 4

Lost five kg: _____

Four steps backward: _____

B Six miles south: -6

F Lost ten points: -10

Six miles north: _____

Scored ten points: _____

C Spent nine dollars: _____

G Football: Gained 7 metres _____

Earned nine dollars: 9

Lost 7 metres: _____

D 8°C above zero: 8

H 100 metres below sea level: _____

8°C below zero: _____

100 metres above sea level: _____

4. Give the integer that best fits the description.

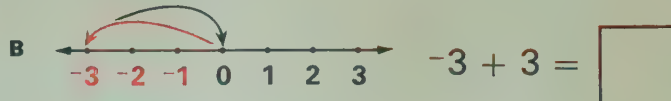
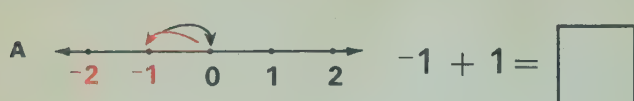
A Lowest recorded temperature: 89°C below zero. _____

B Highest recorded temperature: 58°C. _____

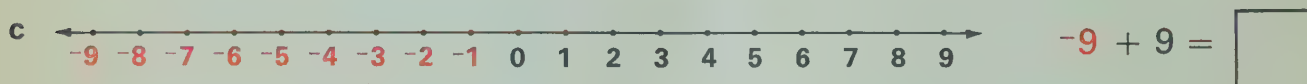
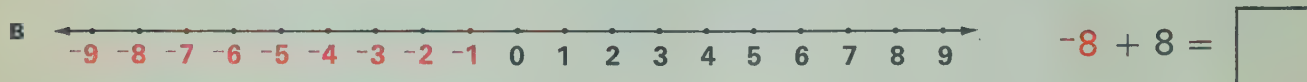
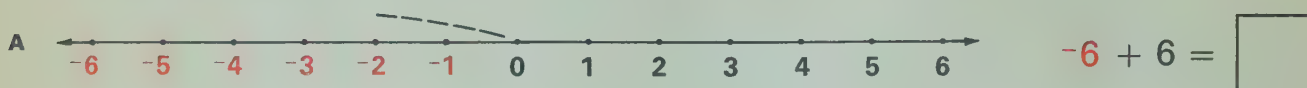
C Mount Everest is 8848 metres above sea level. _____

D The Dead Sea is 375 metres below sea level. _____

1. Study the number-line pictures and complete the equations.

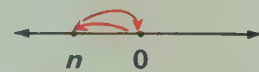


2. Show the jumps on the number lines and complete the equations.

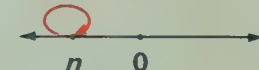


3. Complete the sentences.

A The sum of each **negative** number and its opposite is _____.



B The sum of any number and 0 is _____.



4. Find the sums.

A $-4 + 4 = \square \rightarrow 4 + -4 = \square$

C $-29 + 29 = \square \rightarrow 29 + -29 = \square$

B $-9 + 9 = \square \rightarrow 9 + -9 = \square$

D $-567 + 567 = \square \rightarrow 567 + -567 = \square$

5. Find the sums. Use the commutative and associative principles.

A Since $4 + (3 + -3) = \square$, we know that $(4 + 3) + -3 = \underline{\hspace{2cm}}$

B Since $(6 + 2) + -2 = \square$, we know that $8 + -2 = \underline{\hspace{2cm}}$

C Since $8 + -2 = \square$, we know that $-2 + 8 = \underline{\hspace{2cm}}$

D Since $-9 + (-8 + 8) = \square$, we know that $(-9 + -8) + 8 = \underline{\hspace{2cm}}$

E Since $(-6 + 6) + (-8 + 8) = \square$, we know that $14 + (-6 + -8) = \underline{\hspace{2cm}}$

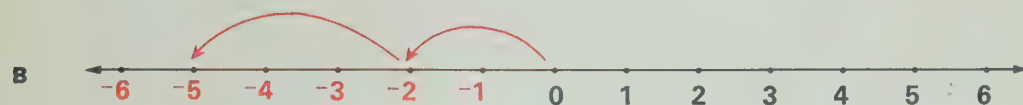
F Since $(-3 + 3) + (7 + -7) = \square$, we know that $(-3 + -7) + 10 = \underline{\hspace{2cm}}$

● Adding Positive and Negative Numbers

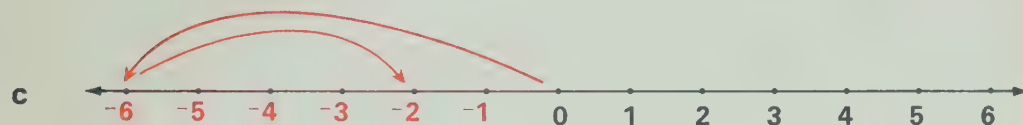
1. Jumps to the right show addition of positive numbers.
Jumps to the left show addition of negative numbers.
Solve the equations.



$7 + -4 = \boxed{}$

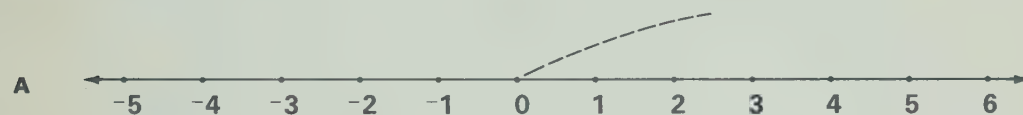


$-2 + -3 = \boxed{}$



$-6 + 4 = \boxed{}$

2. Show the jumps and solve the equations.



$5 + -2 = \boxed{}$



$-1 + -3 = \boxed{}$



$-5 + 3 = \boxed{}$

3. Find the sums.

A $5 + -5 = \underline{\hspace{2cm}}$	B $3 + -3 + 2 + -2 = \underline{\hspace{2cm}}$	C $-6 + 6 = \underline{\hspace{2cm}}$
$4 + 5 + -5 = \underline{\hspace{2cm}}$	$5 + (-3 + -2) = \underline{\hspace{2cm}}$	$-4 + -6 + 6 = \underline{\hspace{2cm}}$
$9 + -5 = \underline{\hspace{2cm}}$	$-3 + -2 = \underline{\hspace{2cm}}$	$-10 + 6 = \underline{\hspace{2cm}}$

4. Find the sums.

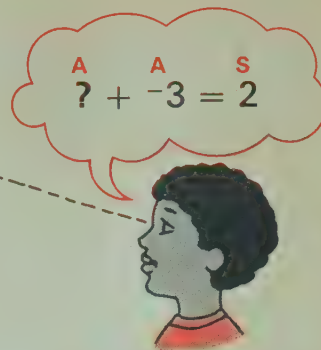
A $15 + -7 = \underline{\hspace{2cm}}$	B $-5 + -3 = \underline{\hspace{2cm}}$	C $-14 + 8 = \underline{\hspace{2cm}}$
D $10 + -9 = \underline{\hspace{2cm}}$	E $-6 + -1 = \underline{\hspace{2cm}}$	F $-8 + 5 = \underline{\hspace{2cm}}$

● Subtracting Positive and Negative Numbers

1. To subtract positive and negative numbers, find the missing addend. Write the correct difference in the box.

$$\overset{\text{S}}{2} - \overset{\text{A}}{-3} = \overset{\text{A}}{\boxed{}}$$

2. When you find the **missing addend** in the first equation, you will have found the answer to the subtraction problem. Solve the equations.



A $\boxed{} + -8 = 0$
 $0 - -8 = \boxed{}$

G $\boxed{} + -9 = -12$
 $-12 - -9 = \boxed{}$

M $\boxed{} + 3 = 2$
 $2 - 3 = \boxed{}$

B $\boxed{} + -8 = 1$
 $1 - -8 = \boxed{}$

H $\boxed{} + -12 = -18$
 $-18 - -12 = \boxed{}$

N $\boxed{} + 4 = 3$
 $3 - 4 = \boxed{}$

C $\boxed{} + -8 = -1$
 $-1 - -8 = \boxed{}$

I $\boxed{} + -6 = 2$
 $2 - -6 = \boxed{}$

O $\boxed{} + 5 = 2$
 $2 - 5 = \boxed{}$

D $\boxed{} + -8 = -8$
 $-8 - -8 = \boxed{}$

J $\boxed{} + -5 = 3$
 $3 - -5 = \boxed{}$

P $\boxed{} + 2 = -4$
 $-4 - 2 = \boxed{}$

E $\boxed{} + -3 = -8$
 $-8 - -3 = \boxed{}$

K $\boxed{} + -4 = 5$
 $5 - -4 = \boxed{}$

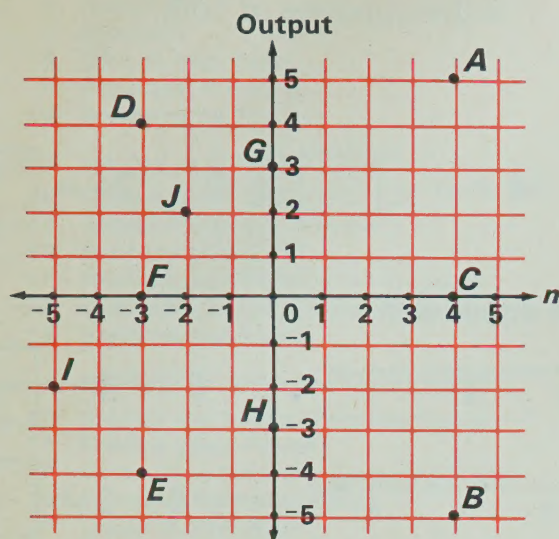
Q $\boxed{} + 3 = -1$
 $-1 - 3 = \boxed{}$

F $\boxed{} + -5 = -10$
 $-10 - -5 = \boxed{}$

L $\boxed{} + -3 = 4$
 $4 - -3 = \boxed{}$

R $\boxed{} + 6 = -2$
 $-2 - 6 = \boxed{}$

1. In the blanks below, give the number pair for each point on the graph beside the letter for that point.



A: (____, ____) F: (____, ____)

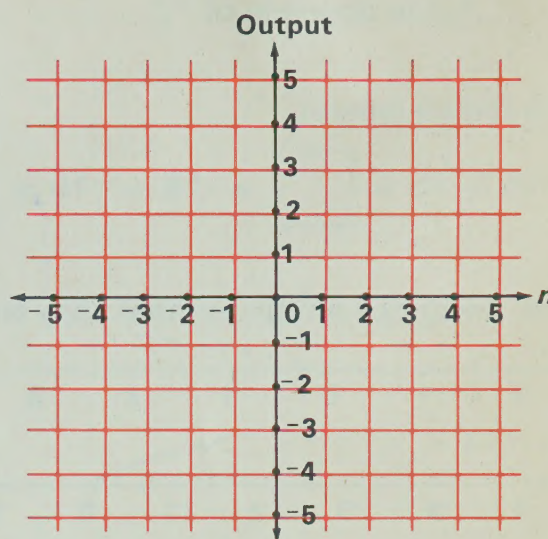
B: (____, ____) G: (____, ____)

C: (____, ____) H: (____, ____)

D: (____, ____) I: (____, ____)

E: (____, ____) J: (____, ____)

2. Graph each pair of integers given below. Label each point with the letter for the number pair.



A: (3, 4) F: (4, -5)

B: (3, -4) G: (-5, 0)

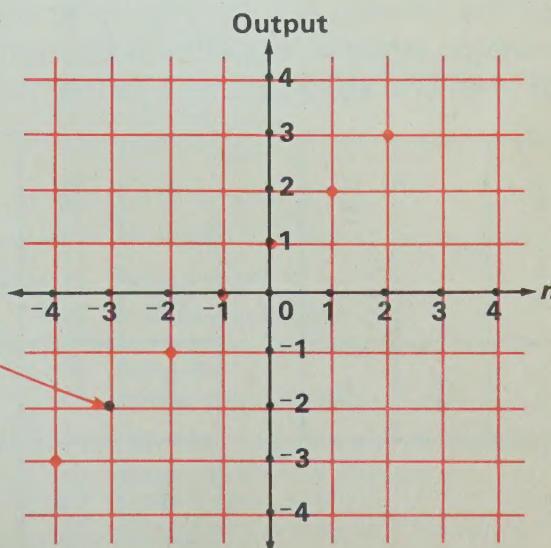
C: (-3, 4) H: (0, -5)

D: (-3, -4) I: (2, -4)

E: (-5, -5) J: (-4, 2)

3. Complete the table for the function rule and give the missing co-ordinates. Then graph the co-ordinates.

Function rule		
$n + 1$		
n	Output	co-ordinates
-4		→ (____, ____)
-3	-2	→ (____, ____)
-2		→ (____, ____)
-1		→ (____, ____)
0		→ (____, ____)
1		→ (____, ____)
2		→ (____, ____)





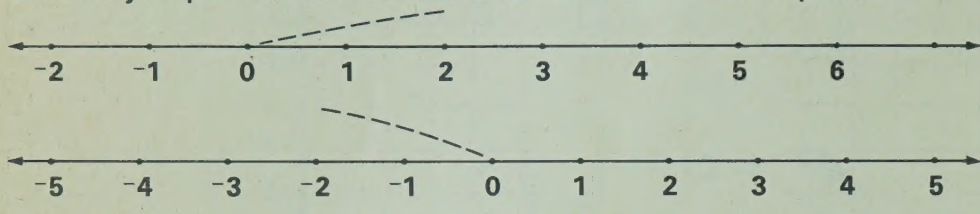
1. Give the missing numbers.

- A is the opposite of 7. c is the opposite of -612.
B is the opposite of -7. d is the opposite of 100.

2. Solve the equations.

A $-15 + 15 = \square$ B $15 + -15 = \square$ c $-18 + 0 = \square$ d $0 + -24 = \square$

3. Show the jumps on the number lines and solve the equations.



$6 + -1 = \square$
 $-5 + 3 = \square$

4. Fill the blanks.

- A $9 + -9 = \underline{\hspace{2cm}}$ B $4 + -4 + 3 + -3 = \underline{\hspace{2cm}}$ c $-4 + 4 = \underline{\hspace{2cm}}$
 $4 + 9 + -9 = \underline{\hspace{2cm}}$ $7 + (-4 + -3) = \underline{\hspace{2cm}}$ d $-9 + 4 = \underline{\hspace{2cm}}$
 $13 + -9 = \underline{\hspace{2cm}}$ $-4 + -3 = \underline{\hspace{2cm}}$ e $-5 - 4 = \underline{\hspace{2cm}}$
 $4 - -9 = \underline{\hspace{2cm}}$ $-7 - -3 = \underline{\hspace{2cm}}$ F $-5 + -4 = \underline{\hspace{2cm}}$

CHANGE OF PACE

Find the missing numbers so these squares will be **magic squares**.
(In magic squares, the sum of the numbers in each row, in each column, and from corner to opposite corner is the same.)

$\frac{1}{3}$		$\frac{1}{4}$
$\frac{1}{8}$		
$\frac{1}{6}$	$\frac{3}{8}$	$\frac{1}{12}$

$\frac{1}{2}$	$\frac{1}{16}$		
$\frac{5}{32}$		$\frac{5}{16}$	$\frac{1}{4}$
$\frac{9}{32}$		$\frac{3}{16}$	$\frac{3}{8}$
$\frac{1}{8}$	$\frac{7}{16}$		$\frac{1}{32}$

5	-9		2
	-4	-5	1
-7	3	4	-10

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